PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY.

VOL. XX.

SESSION 1875-76.

Nos. I. to VI.

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CONTENTS OF VOL. XX.

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No. I.

Page
RAWLINSON, SIR H C —Opening Address of .. 6
WATTS, W L —Journey across the Vatna Jokull, in the Summer of 1875 . 21
GRANT, LIEUT -COL J A, C B —On Mr H M Stanley's Exploration of the Victoria Nyanza .. 34
RAWLINSON, Sir H C —On the Progress of Colonel Gordon's Expedition . . 50

ADDITIONAL NOTICES

MARKHAM, C R, C B, F R S —On the Progress of the Arctic Expedition to July 17, and the Return Voyage of the *Valorous* . 55
CHIPPINDALL, LIEUT W H, R E —Journey beyond the Cataracts of the Upper Nile towards the Albert Nyanza .. 67
BELLVILLE, A, F.R G S —Journey to the Universities' Mission Station of Magila, on the Borders of the Usambara Country .. 74
COOPER, H T M —On a proposed Trade Route from the Gambia to Timbuctoo . 78
STRACHEY, LIEUT -GENERAL R, R E, C S I., F R S —Address to the Geographical Section of the British Association at Bristol, August 26, 1875 .. 79

No. II.

ANNOUNCEMENT —LIVINGSTONE EAST COAST EXPEDITION —Lieut. Cameron's Arrival at the West Coast of Africa .. 117

STONE, OCTAVIUS C, F.R G S —Discovery of the Mai-Kassa, or Baxter River, New Guinea . 92
MAYNARD, J HOWARD —Journey from Antananarivo to Mojunga .. 110
CAMERON, LIEUT V. L —Letters detailing the Journey of the Livingstone East Coast Expedition from Lake Tanganyika to the West Coast of Africa .. 118

ADDITIONAL NOTICES.

STANLEY, H. M —Letters on his Journey to the Victoria Nyanza and Circumnavigation of the Lake .. 134
GEORGE, STAFF-COMMANDER C —Note on the Height of the Victoria Nyanza . 159
ADAMS, CAPT.—Remarks on the Weather, Wind, and Ice in the Arctic Seas during the past Season, as affecting the Prospects of the Arctic Expedition .. 160

No. III.

Page
ANNOUNCEMENT —LIVINGSTONE EAST COAST EXPEDITION—Arrangements for Lieut Cameron's Return, and the sending back of his Native Attendants 164, 183

GOLDSMID, SIR FREDERIC, K C S I —Capt the Hon G Napier's Journey on the Turcoman Frontier of Persia . . . 166
MARGARY, Mr.—Extracts from the late Traveller's Diary Hankow to Tali-fu 184
Extracts from his subsequent Letters 208

ADDITIONAL NOTICES.

THOMSON, J T., F R G S —Marco Polo's Six Kingdoms or Cities in Java Minor, identified in translations from the ancient Malay Annals (*with a Chart*) 215
WALKER, CAPT J B , F R G S —Notes of a Visit to the Old Calabar and Qua Rivers, the Ekoi Country, and the Qua Rapids . 224
PRESTOE, H.—On the Discovery of a Boiling Lake in Dominica 230

No IV.

ANNOUNCEMENTS —LIVINGSTONE EAST COAST EXPEDITION—Return of Lieut Cameron's Native Attendants .. . 234
Arrangements for Welcoming Lieut Cameron's Return to London . 274
WELCOME TO LIEUT CAMERON —Speech of H R H the Duke of Edinburgh .. 303

ELIAS, NEY, Gold Medallist R G S —Visit to the Valley of Shueli, Western Yunnan 234
MARKHAM, C R , C B , F R S —Afghan Geography . . 241
MACFARLANE, REV S —Ascent of the Fly River, New Guinea .. . 253
STONE, OCTAVIUS C , F R G S —Recent Explorations in the Interior of New Guinea, from Port Moresby 266
ANDERSON, CAPT S , R E —The North-American Boundary, from the Lake of the Woods to the Rocky Mountains . 274
CAMERON, LIEUT. V. L , R N —Journey across Africa, from Bagamoyo to Benguela 304
STONE, OCTAVIUS C , F R G S —Description of the Country and Natives of Port Moresby and Neighbourhood, New Guinea 330
D'ALBERTIS, SIGNOR L M —Remarks on the Natives and Products of the Fly River, New Guinea . . 343

ADDITIONAL NOTICES

COLSTON, STAFF-COLONEL R E —Itinerary from Debbe to El Obeyad, on the Upper Nile 357
SOUTHESK, EARL OF—On the Correction of an Error in Mr Hind's Map of the Elbow of the South Branch of the Saskatchewan . 362

CONTENTS OF VOL. XX.

No. V.

Page

Anniversary Meeting:—

Presentation of Royal and other Awards 368

Address by Sir H. C. Rawlinson, K.C.B., etc., etc., President 377–448

No. VI.

Announcements:—Col. Gordon's Expedition—Letter from the Foreign Office 473

Lieut. Cameron's Expedition—Government Grant in aid of 473

Special Scientific Branches of Geography—Grant by the Council towards the Promotion of 493

Young, E. D.—Lake Nyassa Mission . 451

Bigg-Wither, Thomas P., C.E.—Valley of the Tibagy, Brazil . . 455

Stone, Gen. C. M. P. }
Baker, Sir Samuel }—Circumnavigation of the Albert Nyanza . 470

Hay, Capt. J. S.—The District of Akem, West Africa . . 475

Shaw, R. B.—A Prince of Kâshghar on the Geography of Eastern Turkistan 482

ADDITIONAL NOTICE.

Johnston, Keith.—Notes on the Physical Geography of Paraguay .. 494

Strachan, R.—Report on Johnston and Congreve's Hypsometrical Observations in Paraguay 504

Annual Grant by the Council, of £500 for the Promotion of Special Scientific Branches of Geography 509

Schools Prize Medals of the Royal Geographical Society—Report for 1876 and Programme for 1877 .. . 513

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PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Published December 31st, 1875]

SESSION 1875–76

First Meeting, 15th November, 1875

Major-General Sir HENRY C. RAWLINSON, K.C.B, President, in the Chair.

Elections—*Jno M Dunn, Esq* , *Albert Brown Ghewy, Esq*, C E , *E Holborow King, Esq* , *T Swift Taylor, Esq.*; *Lieut Chas. Moore Watson*, R E

General C M P Stone, Chief of the General Staff, Egyptian Army, was elected Honorary Corresponding Member of the Society

Presentations — *Capt J Tyndale Greenfield*, R A., *William Elliot, Esq*

Donations to the Library from June 28th to November 15th, 1875 —Clarke's Travels, 5 vols 4to, Charlevoix, Histoire de la Nouvelle France, 3 vols , Pottinger's Travels and Memoirs, Tuckey's River Zaire, Park's Travels in Africa, 2 vols., Parry's First and Second Voyages, Young's Travels, Belzoni's Narrative, Wilson's Expedition to Egypt, Amherst's Embassy to China, De Saussure, Voyages dans les Alpes, 4 vols , Barrow's Voyage to Cochin China, Daubeny on Volcanoes, Sonnini, Greece and Turkey, 2 vols, Egypt, 3 vols , Weld's America, 2 vols., Pennant's Wales, 3 vols , Pennant's Chester, Walsh's Journey from Constantinople, Eustace's Italy, 4 vols ; Nibby, Viaggio Antiquario, Schomburgk, British Guiana; Gilpin's Northern Tour, Vol I , McClelland's Geology of Kemaon, Voyage de La Perouse, 4 vols , Phillips' Vesuvius, Adams' Silesia, McLeod's Voyage, Wraxall, Northern Tour, Lyell, Elements and

Principles of Geology, Chatterton, Pyrenees and Spain, 2 vols, Chateaubriand, Itinéraire, 2 vols., Swinburne, Two Sicilies and Spain, 6 vols, Lewis' Traveller's Guide, British Tourist, 6 vols, Kotzebue, Siberia and Italy, 7 vols, and Geographical Dictionary (*in all*, 80 *vols*, *General Sir Wm Codrington*, G C B, &c) Eight bound folio vols of Parliamentary papers relating to the search for Sir J Franklin (*J. Barrow, Esq*) Notes on Chinese mediæval travellers to the West, by E. Bretschneider, Shanghai, 1875 (*Author*) Snow-huts, Sledges, and Sledge Journeys, by John Rae, 1875 (*Author*). Nicaragua and the Interoceanic Canal, by E. Bernard, Washington, 1874, Jules Marcou on a 2nd Edition of the Geological Map of the World, Boston, 1873, and astronomical observations for 1872 (*Prof Nourse*) Honduras and the Interoceanic Railway, by W. A. Brooks, 1874 (*Author*) Essay on physical features of the Valley of the Minnesota, by G K Warren, Washington, 1874 (*Author*) U S. Geological Survey of the Territories, Report, Vol. VI., Bulletin, No 2, second series, and Miscellaneous publications, No. 3 (*Dr. F V Hayden*) Geological Survey of Missouri, Report, 1855–1871, and 1873–74, with atlas, and Preliminary Report on Iron ores and coal fields, with atlas (*G. C Broadhead, State Geologist*) Correspondence respecting Sir Bartle Frere's Mission to the East, 1873 (*E G Ravenstein, Esq*). Russians in the East, Goldsmid's Central Asia, Long's Notes on a visit to Moscow and Kief in 1873, Coningsby's Russo-Turkish War, Russian Primer, Philipos' Syrian Christians of Malabar, Fowler's History of the Crimean War, Kitto's Tahtar Tribes, Luillier's Voyage aux Grandes Indes, Memoirs of the Aksakof family, Dilworth's History of Thamas Kouli Khan, Guide du palais Oroujeynaya Palata, Sir J Lawrence as Viceroy of India, Thoughts on popular education, by Takoordass Chuckerbutty, Long's Village Communities in India and Russia, Oppert's Inscriptions Assyriennes des Sargonides, Crawshay's cause of the Indian Mutiny, Long's Social Conditions of the Muhammadans of Bengal, and Peeps into Social Life in Calcutta 100 years ago, Report of E. India Committee of Colonial Society on Affghan War, Crealock's Foreign Politics, Sir M. Wells in India, Bombay Riots in 1874, Bishop Wilson's Journal Letters, and Ives' Voyages from England to India (*Rev. J. Long*) Europæi in America avanti Colombo, by F Nardi, Roma, 1875 (*Author*) Light as a motive power, Vol. I, by R. H. Armit, 1875 (*Author*) Chile ilustrado, por R S. Tornero, Valparaiso, 1872 (*Admiral E. Ommanney*, C.B., F R.S) Ein Fund vorgeschichtlicher Steingerathe bei Basel, von A. Müller, Basel, 1875 (*Author*) Bædeker's Der Schweiz, Palæstina und Syrien, Belgien und Holland, and Belgium and Holland," 1875 (*Editor*). The Tribes inhabiting the Neilgherry Hills, by F. Metz, Mangalore, 1864, and the Peasants of Chamouni, 1823 (*S. M. Drach, Esq*) Notes on public works in the United States and in Canada, by Sir C. A Hartley, 1875 (*Author*). Report to Directors of the Madeira and Mamoré Railway Company, by E. D Mathews, 1875 (*H W. Bates, Esq*). Dictionnaire et Grammaire de la langue commerciale de l'Archipel Malaise, par Léonce Richard, Bordeaux, 1873 (*Author*) The Jummoo and Kashmir Territories, by F. Drew, 1875 (*Author*). Daduchos, von P. W. Forchhammer, Kiel, 1875 (*Author*). Amphiorama, par F. W. C Trafford, 2^e notice, Zurich, 1875 (*Author*). L'Art Khmer, par Le C^{te} de Croizier, Paris, 1875 (*Author*). Résumé de renseignements statistiques sur la Norvége; Christiania, 1875 (*Dr. L K. Daa*). Optegnelser fra den osterrigsk-ungarske Polar expedition, ved E Carlsen, Tromso, 1875 (*Author*). Ein Blick auf die Resultate der Hissâr'schen Expedition, von P. Lerch, 1875 (*Author*). Results of Meteorological Observations, 1874, Juggarow's Observatory (*A. V. Nursingrow, Esq*). Notes on the province of Chêkiang, by F W White, Bath, 1875 (*Author*). Interoceanic Canal, route of Paya, by L De Lacharrne, Misiguay, 1874 (*Author*). Facsimile of Letter of Columbus, describing his first voyage to the Western Hemisphere, New York, 1875 (*S L M. B.*). The duty of States in teaching the Science of plant life, by L. A. Bernays, Brisbane, 1875 (*Author*). On a Fossil Saurian Vertebra from the Arctic Regions, by A. Leith Adams, Dublin, 1875 (*Author*) Trade and Salt in India free, by Lieut-Gen Sir G. Balfour, 1875 (*Author*). Notes on the Manufacture of Pottery among Savage races, by C F. Hartt, Rio de Janeiro, 1875 (*Author*). The Challenger's Crucial Test, by J. Croll, 1875 (*Author*). The Royal Tiger of Bengal, by J. Fayrer, 1875 (*Author*) Reasons for mining on physical principles, by J. W. Beilby, Melbourne, 1875 (*Author*) On Fog-signals, &c, by Admiral Collinson and others (*Admiral Sir R Collinson*). Artes Africanæ, by G. Schweinfurth (*Author*). Epitome of Correspondence relating to Merv, Fedchenko's Letters from Kokand, Memorandum on the Country of the Turcomans, Description of Kostenko's Journey to Bokhara in 1870, and Narrative of Russian Expedition to Khiva in 1717 (*R. Michell, Esq*) Anuario hidgrográfico de la Marina de Chile, Año I, 1875 (*Stratford Lecky, Esq*). Geografia de Centro-América, por Roderico Foledo, Guatemala, 1874 (*General P R. Negrete, Min Plenip Rep. Salvador and Guatemala*). L'Afrique Équatoriale, Okanda, Bangouens, Osyéba, and Gabonais, Pahouins, Gallois, par le Marquis de Compiègne Paris, 1875 (*Author*) The Voyage of Verrazzano, by H C. Murphy New York, 1875 (*Author*). Heron's Translation of Niebuhr's Travels through Arabia, 1792, and Incidents of Travel in Egypt, &c., by J L Stephens, 1836 (*A G Lock, Esq*) Account of Survey Operations, Mission to Yarkand and Kashgar, by Captain H. Trotter, Calcutta, 1875 (*Author*) Memorandum on Metals and Minerals of Upper Burmah by G. A Strover, 1873, Selections from Records of the Bombay Government, new series, Nos CXLVII and CXLVIII, of the Madras Government, Nos XLI and XLIII, and Selections from Records of Government of India (Foreign Department), Nos CXVII and CXVIII. Statements of moral and material progress of India, 1871–72, 1872–73, Medico-topographical Report on Muscat, by C. T Peters, 1875 (*H. M Secretary of State for India*) Annales hydrographiques, Nos 219, 220, 528, 534–6, 538–541 (*Dépôt des Cartes, &c, de la Marine*) U. S Hydrographic Office Publications, No 58 (*Commodore Wyman*) Australian Statistics for 1873, Statistical Register of Victoria, 1874, parts 1–4, Report of Chief Inspector of Mines, and Mineral Statistics, 1874, Reports of Mining Surveyors and Registrars, and of Government Statists held in Tasmania, 1875, Results of Census, New Zealand, March, 1874 (*The Australian Government*) Report of Committee of Council on Education (England and Wales), 1874–75, and parts 1–5 of Appendix (Scotland), First and Second Reports (*The Education Commission*) Diary of Explorations of Mr Ernest Giles in Central Australia, 1872, and Geological Survey of Newfoundland, Report of progress for 1874 (*H M Secretary of State for the Colonies*) Synopsis of results of operations of the Great Trigonometrical Survey of India, Vol IV, 1875 (*The Office of the Survey*) Essai sur la langue Poule, par le Général Faidherbe, Paris, 1875 (*Author*) The Franco-German War, Sect 6, Part 1, and Sect 7 (*H. M Secretary of State for War*) De la notion des lacs du Nil chez les Anciens, Le pays des plumes, and Sur l'origine de le tradition des Fourmis qui ramassent l'or, par Frederik Schiern, Copenhague, 1873–75 (*Author*). The Itineraries of William Wey, and illustrative map, Roxburghe Club publications, 1857 and 1867 (*The Earl of Powis*) Manual of Natural History, &c, of Greenland, prepared under the direction of the Arctic Committee of the Royal Society, 1875, and H.M S Challenger, Report No 4, 1875 (*The Lords Commissioners of the Admiralty*). Machærus, the prison-house of John the Baptist, by E. Dumergue, Douglas, 1875 (*Author*). Explorations in the valley of the Madeira from 1749 to 1868, by G E. Church, 1875 (*Author*). On the examination of adjusters of Compasses, by

Thomas Brassey, 1871 (*Author*). Die projectirte Verbindung des Algerisch-tunesischen Chott-Gebietes mit dem Mittelmeere, von Guido Stache, Wien, 1875 (*Author*). Die Oesterreichisch-ungarische Nordpol-Expedition, von Julius Payer, Lief. 1 and 2, Wien, 1875 (*Author*). 2te und 3te Jahresbericht der Commission z. wiss. Untersuchung der deutschen Meere, Kiel, 1875 (*The Commission*). De la part prise par les Portugais dans la découverte de l'Amérique, par L. Cordeiro, Lisbonne, 1876 (*Author*). Reliquiæ Aquitanicæ, completion of the Work (*Executors of the late H. Christy, Esq.*). Projet d'un Canal Interocéanique dans le Darien, par G. de Fontbonne, Sancerre, 1875 (*Author*). Die zweite deutsche Nordpolar-Expedition, Officielle Mittheilungen, Braunschweig, 1870 (*The Bremen Committee*). Sun's true bearing, or Azimuth Tables, by Captain J. E. Davis and P. L. H. Davis, 1875 (*Authors*). The Gambia and its proposed cession to France, by C. Fitzgerald, 1875 (*Author*). Redogorelse for den Svenska Polar expeditionen ar 1872–73, af A. E. Nordenskiold, Stockholm, 1875 (*Author*). On the Indian tribes and languages of Costa Rica, by W. M. Gabb, Philadelphia, 1875 (*Author*). The probability of reaching the North Pole discussed, by Daines Barrington, 1775 (*Walter Rye, Esq.*), and the current issue of publications of corresponding societies, &c.

DONATIONS TO MAP-ROOM FROM JUNE 28TH TO NOVEMBER 15TH, 1875.—364 sheets of Ordnance Maps (*First Commissioner of Works, through Sir Henry James, Director*). 41 sheets of Admiralty Charts (*Hydrographic Office*). 132 sheets of India Survey Maps (*The Secretary of State for India*). 43 French Charts (*The Ministère de la Marine*). MS. Map of Col. Long's route, Gondokoro to Lake Victoria, Map of route between Old Dongola and El Fascha, by Col. Purdy, MS. Map of country between El Fascha and Gebel Medob, by Lieut.-Col. Mason, MS. Map of the Upper White Nile between Ragaff and Kerrie, Map of route followed by Major Prout from Khartum to Obeiyad, MS. Map of the White Nile from Fashoda to Gondocoro, surveyed by Lieuts. Watson and Chippendall, R.E., October and November, 1874 (*General Stone, Chief Staff, Egyptian Army*). Map of Iceland, 1761 (*J. Barrow, Esq.*). MS. Map of North-west part of Borneo (*Lieut. De Crespigny, R.N.*). Planispheres illustrating the Transit of Venus (*Cavalier Ignace Villa*). Mouth of River Rufiji, MS. (*Captain Sulivan, R.N.*). Chart of Mediterranean Sea (*Professor H. Nourse*). Map of New South Wales (*G. Street, Esq.*). Map of St. Petersburg and Moscow Railway (*Rev. J. Long*). Map of South-Western Arabia, Map of Khuzistan (*Topographical Office*). Maps issued by the U S Geological Survey of the territories (*Professor F. V Hayden*) Topographical map of Mount Pelvoux Map of Mount Perdu and the Central Pyrenees 13 Maps of Nevada and Nebraska, U. S (*S Curley, Esq*) Map of Abu-Shahr Peninsula and Town (*India Office*) MS Sketch-map of route from Gondokoro to Dufflé, by J Kemp, Esq (*Col Gordon*) Map of Franz Josef Land (*Lieut. Payer*) 15 Maps of parts of Chili and Patagonia (*Capt Lecky*) 13 Maps of the Mittheilungen (*Dr A. Petermann*) Map of European Turkey, in 20 sheets, by F Handtke (*Carl Flemming*). Map of Banda, Netherlands East Indies, by A. Guyot Statistical Atlas of the United States, consisting of 60 Maps and Memoir (*F A. Walker, Esq*, M A) The Unrivalled Atlas of Modern Geography for Schools, consisting of 34 Maps (*W and A K Johnston*) Stieler's Atlas of Modern Geography, 8 parts; Spruner's Atlas of Medieval Geography, 1 part (*J Perthes*) Atlas of the Delta of the Danube, by the European Commissioners, 2 vols, containing 112 maps and diagrams, memoirs (*Secretary of State, Foreign Office*) Photograph of the town of Zanzibar, Photograph of inscriptions on Mombaza Fort (*A Laing, Esq, Zanzibar*) Original MS tracing of the Victoria Nyanza, by H M Stanley, Enlargement of the same, by Edwin Arnold, Esq, M A, F R G S, Sketch-map of the Delta of the Rufiji River, by H M Stanley (*E Arnold, Esq*, F R G S, '*Daily Telegraph*') 9 Maps of reconnaissances made by officers of the Egyptian Army in Darfur, and on the Upper White Nile (*H R H the Prince of Wales*, through *Sir Bartle Frere*) Map of the Colony of Natal, by Alexander Mair, Natal, 1875, mounted on rollers (*Dr Sutherland*, through *E Stanford, Esq*)

The PRESIDENT read his opening Address, as follows —

GENTLEMEN,—Our forty-sixth Session opens under the most favourable auspices Enjoying the unabated confidence of the Senate of the University of London, we are permitted by that liberal and enlightened body to hold our Evening Meetings, as in former years, in this handsome and commodious Hall, very important aid being thus afforded us in acquiring Geographical knowledge and in rendering that knowledge accessible to the public Our numbers continue also steadily to increase, the accessions to our list of Fellows far exceeding the losses from death and retirement, and the augmentation which thus ensues of our material resources tending largely to extend and multiply our means of usefulness The list, indeed, which has just been read to you, containing 73 names, exhibits the largest number of candidates that have ever been proposed for election at a single meeting of this Society. This is no doubt in the present a subject of earnest congratulation, but in the future it is not unaccompanied by a feeling of some anxiety as to how far expansion may be compatible with a sound organisation and with working efficiency During the last twenty years, for instance, our register of Fellows has risen from 1000 to 3000 During the next twenty years it may be expected to increase from 3000 to 5000 The question then arises, and it is one that we shall have some day seriously to consider, where is expansion to stop? up to what limit can the machinery of a single Society provide for the accommodation and the Geographical instruction of the public of this great metropolis? Nor has there been any diminution of our influence and reputation During the past year our Society has made itself felt in various ways We have the proud satisfaction of knowing that it was owing to our persistent and well-argued advocacy that the Government became convinced of the desirability of sending forth an Arctic Expedition, a conviction which the Prime Minister first communicated to the public through the President of this Society. On another recent occasion we succeeded in persuading the Government, at the last moment, to send a Commissioner to the Geographical Exhibition at Paris, an evil of some magnitude being thus avoided, for there can be no doubt that we should have suffered both in reputation and material interests, if of all the Powers of Europe England had been alone unrepresented at this great international gathering The private establishments of the country, which, as is well known, constitute our chief Geographical strength, were, it is true, prevented for the most part by want of notice from sending their contributions to Paris, but the various departments of Government—the Admiralty, the Topographical branch of the War Office, the Ordnance Survey, and the India Office—furnished a goodly collection of maps and charts, which were able to stand comparison with the most finished specimens of Continental work, while the plans and diagrams and original route-surveys contributed by the Palestine Exploration Fund, and by our own Society, excited universal interest I was pleased, indeed, to observe that amid the many costly and elaborate articles exhibited in the various halls and galleries of the Salle d'État, nothing seemed to attract the attention of Geographers more than a complete set of the 'Transactions' of this Society, the forty-four volumes of our 'Journal,' with their accompanying maps, being subject to constant consultation. The Fellows are probably aware that the Paris Summer Exhibition, to which I have thus alluded, was designed to serve as a sort of illustration to the International Congress of Geographers which met at the same time in the French capital under the presidency of Admiral de la Roncière le Noury. This Congress was attended by all the most eminent travellers and Geographers of the age, and numerous questions of high scientific interest and importance were discussed at its sittings, the Presidents of the several Geographical Societies of Europe taking the Chair at the General Meetings according to the seniority of their respective countries It was found that the London Society was thus only third upon the list, the Berlin and Paris Societies being both earlier Institutions, but it was universally admitted that in regard to numbers, wealth, and influence, and especially as the patrons of discovery and the guardians of the best interests of Geography, we were at the head of this department of science I may further mention that I attended the Congress in person as one of its honorary patrons, and presided in my turn at its sittings, that Sir Rutherford Alcock, one of our Vice-Presidents, represented the Royal Geographical Society, and that Colonel Montgomerie, our Associate and Medallist, so well known for his labours in the Great Trigonometrical Survey of India, and especially for his beautiful Himalayan maps, officiated as Her Majesty's Commissioner, while Major Wilson of our Council, and Mr Major, our honorary Secretary, also took part in the proceedings of the Congress The English party met with every possible attention at the hands of their French entertainers, and left Paris much impressed with the advantages to be derived from such gatherings, where the Geographers of Europe may communicate to each other in personal and friendly intercourse their views and experiences on special subjects of inquiry, where they may mutually learn the latest improvements in Cartography, in surveying and in similar branches of study, and where they may take common counsel as to the furtherance of Geographical Science

The Paris Congress and Exhibition were hardly over when the attention of Geographers was directed to the Meeting of the British Association at Bristol.

The proceedings of Section E at this Meeting are always of interest to our Society, and this year they proved of exceptional importance. The Address, indeed, delivered by the President of the Section, General Strachey, on Physical Geography as a Science, was the most highly-wrought and exhaustive essay on the subject that the Section has ever listened to, and it will be reprinted in the 'Proceedings' of the Society for the general information of the Fellows I will not anticipate the reception which will be accorded to this Address by the Fellows, but when I listened with admiration, not unmixed with surprise, to its eloquent language, its subtle distinctions, its philosophical generalisation, showing such a thorough mastery of the subject, I could not but feel that so profound and accomplished a Geographer was destined before long, in the natural course of events, to preside over the Councils of this great Society. Other papers of interest were also read before the Geographical Section, among which I would particularise 1 Dr. Nachtigal's account of his memorable journey from Lake Chad, through Baghirmi, Waday, and Darfur, to the Nile 2 Colonel Montgomerie's Trans-Himalayan Explorations. 3 Colonel Gordon's narrative of his journeys in Turkistán and across the Pamír Steppes in connection with Sir Douglas Forsyth's Mission to Kashgar 4 Colonel Yule's notice of trade-routes to South-Western China, of special importance in the present state of the Birman-Chinese question, and others of hardly inferior interest Most of these papers were, owing to want of time, read in an abridged form at Bristol, but they have since been presented to the Society, and will be published "in extenso" for the information of the Fellows, either in our 'Proceedings' or our 'Journal' I have also to report that the French Association for the advancement of Science held its annual sitting during the month of August at Nantes, and that Admiral Ommanney attended the Geographical Section of the Meeting, as the delegate of this Society

I now proceed to notice a few matters of general Geographical interest which have taken place during the recess

Equatorial Africa, to which the attention of Geographers for so long a period has been prominently directed, again comes to the front as the scene of the most interesting and important exploration of the year In my Anniversary Address of last May I ventured to anticipate, from Mr Stanley's well-known intrepidity and determination, that being once launched into the interior of Africa, with means and appliances of the most extensive and efficient character, it would not be long before he had resolved the doubts which have existed since the first discovery of the Victoria Nyanza, as to the true nature of that great Nile reservoir—that is, as to whether it was one large sea, studded with islands, as maintained by the first discoverers, Captain Speke and Colonel Grant, or whether it was a mere collection of lagoons, as suggested by Captain Burton and Dr Livingstone, on the strength of native information This anticipation has now been realised, and I am enabled, through the kindness of the proprietors of the 'Daily Telegraph' and 'New York

Herald,' to exhibit to this evening's Meeting a complete chart of the Lake, as delineated by Mr. Stanley, who for the first time has almost circumnavigated its shores. The narrative of Mr Stanley's cruise round the northern and eastern shores of the Lake, which was intrusted to M Linant de Bellefonds, whom he met at M'tesa's Capital, on a mission from Colonel Gordon, was published only this morning in the columns of the 'Daily Telegraph.' If possible, it is of even greater interest than those which preceded it Its recovery would seem to haee been almost miraculous, as it was thrown away in the jungle, when M. Linant's party was attacked by the Baris, and subsequently picked up by the soldiers sent by Colonel Gordon to support his officer. The letter contains many important statements for Geographers, one of them being Mr. Stanley's measurement of 275 feet as the deepest sounding that he obtained in coasting round the Lake this shows that, like Lakes Nyassa and Tanganyika, Victoria Nyanza is a real Lake, and not a mere shallow lagoon. The other letters, despatched *viâ* Zanzibar, and published some weeks ago, acquainted us with all the main features of this most remarkable journey, which I proceed accordingly to recapitulate Mr Stanley, it appears, did not follow the high road from the coast to Unyanyembe, but struck a track further to the east, probably the same by which M'tesa's messengers had previously travelled from Uganda to Zanzibar, and thus reached in 103 days, including halts, the southern shore of the Lake, distance 730 miles from Bagamoyo, having fought a severe battle with the natives on the way, and having also discovered and followed to the Lake a new river, the Shimeeyu, which rises some 300 miles beyond the Victoria Nyanza, and is thus, as far as our present information extends, the true southern source of the White Nile Embarking at a short distance to the east of the Jordans Nullah of Speke in a portable boat, called the *Lady Alice*, which accompanied the Expedition from England, Mr Stanley, with a portion of his followers, succeeded in tracing the sinuous shores of the Lake, along its southern, eastern, and northern sides, to M'tesa's Capital at Uganda His description of this very considerable extent of new country—for we knew nothing of it before except from native information—is full of interest to the Geographer, and would have entitled Mr. Stanley to a very high place among African discoverers if his explorations had been confined to this single voyage From M'tesa's Capital at Uganda Mr Stanley followed the western shores of the Lake to the river Kagera, the Kitangule of Speke, and then seems to have struck across direct to his station on the shore of Usukuma, leaving the south-western corner of the sea for subsequent exploration. His circumnavigation of the Victoria Nyanza covered about 1000 miles, and seems to have been verified throughout by a careful series of observations for latitude and longitude Pending the examination of the register of these observations, we cannot affirm that the positions, as laid down on the map, and which differ slightly from Speke's positions, are rigidly correct, but for all practical purposes Stanley's delineation of the Lake may be accepted as sufficiently accurate, and as a great boon to African Geography With regard also to his hypsometrical observations, it is interesting to note, that whereas there was a difference of more than 400 feet in Speke's calculations of height for the northern and southern portions of the Lake respectively, a difference which first led Geographers to suspect that the Lake might be composed of separate basins of varying elevation, Mr. Stanley's measurement by boiling water at his station east of Jordans Nullah gave a result within 70 feet of Speke's observation, near the same spot, so that the height of the Victoria Nyanza may now be considered to be determined at about 3800 feet above the sea. Mr Stanley intended, after completing his survey of the Victoria Nyanza, to cross the intervening country to the Albert Nyanza, where he hoped, by means of the *Lady Alice*, to make a second voyage of discovery round this hitherto almost unvisited Lake; but more recent intelligence from the Upper Nile leads us to expect that he will have been anticipated in this second achievement by Col Gordon, or by some officers of the Upper Nile Command, as it appears that a steamer has at length forced its way to a point above the principal rapids, from whence the passage to the Albert Nyanza is tolerably free from impediment. This important news is contained in telegrams of two different dates in August, sent by Colonel Gordon to General Stone, Chief of the General Staff at Cairo, and as an inaccurate resumé of their contents only has yet been published in England, I am glad on the present occasion to have the opportunity of reading to you the text of the documents, from copies which have been sent to me from Egypt by Sir Bartle Frere.

1. *Telegram of the* 14*th August*, 1875.

(The Arabic text of the telegram is very confused, but the contents appear to me to be as follows.—)

"We are arrived near to Appudo. They tell us that the river is navigable from here to the mouth of the Asua In ascending the river from Kerrie to this place we have passed two rapids.

"The steamer *Khedive* has succeeded in passing the rapids of Beddin and in reaching Kerrie This vessel will soon arrive here, that is at Appudo The force of the current here is very great"

2 *Telegram of the 20th August*, 1875

"At this date we are in the province of Appudo, with officers and soldiers of Makedi Some soldiers from the south have unexpectedly arrived, and have been added to those coming from the north

"The Governor of Fatiko has written me a letter, in which he informs me that Kaba Rega has been intriguing among the Dongolawa irregulars, and inciting them to evil actions

"M. Linant has arrived with his soldiers in good health The Governor promises to write the necessary letters M Linant had met with Mr Stanley at M'tesa's Mr Stanley stated that Lake Victoria Nyanza is very large, and contains many islands He had navigated the Lake from south to north, being quite alone, *i e*, without being accompanied by any European

"Lieutenant Cameron was eight months previously on the banks of Lake Tanganyika, and desired to proceed towards the west

"M Linant had a fight on the road between M'tesa's Capital and Kilwara, with Kaba Rega's people, near the place where Colonel Long had his battle

"Mr Stanley having already seen the country on the east of Lake Victoria, desires now to pursue his explorations to the west Communication between Uganda, M'tesa's country, and Zanzibar, which had been open, is now impossible, owing to the hostility of the Karagwé tribes"

These brief telegrams are not very clear of themselves, as telegrams rarely are, but read by the light of Colonel Gordon's letters, written during the months of May and June (and which have been published in Paris), supplemented by Lieutenant Chippendall's report of his exploration up the Nile, which was read at the Bristol Meeting, they become sufficiently intelligible. Colonel Gordon appears, during the summer, to have forced his way in Nile boats, or nuggurs, from Regiaf to the mouth of the Asua, the difference of level between these points being over 300 feet. He established stations as he went on at Beddin, at Kerrie, and at Appudo He was, at the latter place, 140 miles from the Albert Nyanza at the end of August, and was preparing to try the ascent of the rapids at Makedo, 8 miles in advance, and where he had already established a station The Pasha's steamer, *Khedive*, in the mean time taking advantage of the rise in the river, had followed in the same course, forcing her way up the rapids at Beddin and Kerrie, and having nearly reached Appudo by the last accounts. The great trial will be the passage of the steamer from Appudo to Makedo, where there are 8 miles of continued rapids and cataracts. Baker estimates one single fall at 40 feet. If the steamer, with the help of tow-ropes, can reach Makedo, the further navigation to the Lake, a distance of 130 miles, is without obstacle. Whilst Gordon was occupied with this ascent of the rapids, his assistant Chippendall had pushed on

70 miles beyond Appudo towards the Lake, and had conciliated the tribes of the neighbourhood, but had not succeeded in reaching the Lake itself Both he and Colonel Gordon report, from native information, that the Nile leaves the Albert Nyanza by two channels, but where the western stream rejoins the main river is still doubtful Colonel Gordon is further inclined to give to the Albert Nyanza a general direction of east and west, rather than north and south He would assign the greatest width of the Lake to the latitude of Magungo, where Baker left it, and where a station is now to be established, and he doubts whether the water of this great basin stretches further south than the equator A sketch map of this part of the river by Chippendall has also reached us

The news of Lieutenant Cameron given in Colonel Gordon's telegrams is no doubt of somewhat older date than stated, and was probably brought to M'tesa's Capital by Arab traders from Unyanyembe We know from Zanzibar that our envoy finally left Ujiji for the west at the end of May, 1874 Since this date no news of him whatever has been received at Zanzibar, although the direct route to Ujiji is more open than it has been for years past.

News of somewhat later date than these telegrams has since been received, to the effect that M Linant, the bearer of Stanley's important letter, had been killed, with thirty-six of his followers, in an attack by the Bari tribe, when near Colonel Gordon's station This lamentable event may possibly retard the execution of this officer's plans *

Before I close this brief account of Mr Stanley's exploration of the Victoria Nyanza—an exploration which does infinite credit to his energy and skill, and which will be explained to you in more detail by the veteran traveller, Colonel Grant, at our next Meeting—I am desirous of drawing attention to the extraordinary munificence of the proprietors of the London 'Daily Telegraph' and the 'New York Herald,' in fitting out this Expedition entirely

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* Sir Bartle Frere informs me, in a letter just received, that His Excellency Nubar Pacha told him another telegram had been received which confirmed the report of young Linant's death, and of Gordon's having been obliged in consequence to give up for the time his visit to the Albert Nyanza, in order to go and punish the tribe who had attacked the party This is the second son that the venerable Linant Bey (the great irrigational engineer of Mehemet Ali and Ibrahim Pacha) has lost in that country With regard to Colonel Gordon's expedition, Sir Bartle writes "Every one speaks most highly of Gordon and his doings—the Khedive and his Prime Minister, as well as the English residents and American missionaries He has not only, so they all say, really checked the slave-trade, and still more the slave-hunting, but he has made his expedition almost pay itself, by economy and by judicious management of the conquered districts"

at their own expense. Such munificence far transcends the efforts of private individuals in the cause of science, and even puts to shame our public institutions, enabling, as it did, the undaunted Mr. Stanley to take the field with four Europeans and 300 natives, amply provided with arms, instruments and supplies, and assured of continued support until he had fairly accomplished his work. And I may add, that the courtesy which has placed at my disposal Mr. Stanley's map of the Victoria Nyanza for the gratification of the Fellows of the Geographical Society, and for the general instruction of the public, is a graceful sequel to the liberality of Mr. Stanley's English and American patrons in preparing the original Expedition. I feel assured, then, that I only express the feelings of the Fellows of the Society in recording our warmest thanks to the proprietors and staff of the 'Daily Telegraph' and 'New York Herald,' for the service they have rendered to the cause of Geography, and in wishing the most complete success to Mr. Stanley's further operations

I have also much pleasure in announcing that His Royal Highness the Prince of Wales, the Vice-Patron of our Society, has just sent to us, through Sir Bartle Frere, as the first Geographical result of his tour in the East, a very interesting collection of route maps of Upper Egypt and its recently-acquired dependencies, which have been executed in the Topographical Department of the Egyptian War Office by General Stone, chief of the Etât Major, from materials furnished in one direction by Colonel Gordon and the officers serving under his orders, and in another, by Colonel Purdy and the officers of the Darfur Expedition. These maps, which contain much new Geographical matter, and which give an earnest of the valuable aid we may expect to receive in the future from General Stone's well-organised Department, were presented to His Royal Highness, under special instructions from the Khedive, by His Excellency Nubar Pasha, the enlightened Foreign Minister of the Egyptian Government, than whom there is no better friend to Geography in the East.

Recent Geographical intelligence from other parts of the African Continent is of no great importance, but still requires to be briefly recorded

The German Expedition to West Africa, from which so much was expected, has been unable to penetrate into the interior in the vicinity of the Congo, the same obstacles which baffled Lieutenant Grandy having again, in this case, proved insurmountable Dr. Gussfeldt, the leader of the Expedition, returned to Europe some time back, and his successor, Herr von Homeyer, has since succumbed to the climate, and finally abandoned the enterprise. The only two officers, indeed, who remain of the original party—Dr. Pogge and Dr. Lasaulx—have now, we understand, shifted their ground to the South, with the intention of starting from the Loanda base and making their way *viâ* Cassange, and through a comparatively easy country, to the mysterious capital of Matiamvo.

In continued reference to the West Coast, I may further mention that we hope during the ensuing Session to have a paper on the Gaboon and Ogowé, from the pen of Mr. R. B. N. Walker, one of our Associates, and an old contributor to the 'Journal,' who has recently returned to England after many years of residence and exploration in these rivers. Mr. Walker, in addition to his own experiences, will also be able to give us the latest authentic accounts of the French Expedition, which, in my last Anniversary Address, I reported to be preparing to ascend the Ogowé, in the hopes of being able to cross the entire Continent of Central Africa to the valley of the White Nile.

On the East Coast, to the south of what is called the Lake Region, two British parties are at work, not, indeed, ostensibly for the purposes of Geography, but still in very little known regions, where every step in advance brings with it some Geographical discovery. Bishop Steere, in the first place, left Zanzibar about two months ago, accompanied by Mr. Alfred Bellville and two other gentlemen, and piloted by Chumah and Susi, Livingstone's two faithful servants, on a benevolent and important mission. The party, indeed, proposed to cross from Lindy Bay, near the mouth of the Rovuma River, to the eastern, or, rather, the north eastern, shores of Lake Nyassa, where they hoped among the friendly Ajao tribe, to find a convenient site for the establishment of a missionary station.

The other party to which I have alluded is that conducted by Mr. E. D. Young, which left England in May last for the purpose of founding a mission station on the southern shores of Lake Nyassa, the friends of the late Dr. Livingstone, in Scotland, having subscribed a sum of about 12,000*l.* for the endowment of this memorial station, to be named Livingstonia, and from whence it is hoped civilization and Christianity may be gradually diffused through the valleys of the Zambesi and its affluents. By the last accounts, Mr Young's party, after experiencing some delay at the mouth of the Zambesi, in putting together the steel boat which they had taken out with them, had departed up the river on their interesting and hopeful mission.

I have received from Lieutenant Conder the following account of the operations of the Palestine Survey during the past season —

"The amount of country added to the Survey of Palestine during the past year is 1500 square miles, making a total of 3500, and leaving about 1400 square miles in Upper Galilee to be completed. One thousand square miles were surveyed in March, April, and the first week of May, including the greater part of the Desert west of the Dead Sea, where Dr. Tristram's observations were confirmed, and the whole of Philistia, with the low-hill country round Beit Jibrin The additions made to former maps in this part were more numerous and more important than in any other district, the number indeed of names and ruined sites fixed is about ten times that previously known

"In the north of Palestine 180 square miles were added to the map, completing Lower Galilee, the triangulation has been carried to the peaks of the high range of Jebel Yermúk, and can thence be easily extended northwards

"A line of level has been commenced between the Sea of Galilee and the Mediterranean, the expense, to be defrayed by a special grant of 100*l* from the British Association The survey was checked by the assault on the survey party by the fanatical Moslems of Safed, in which Lieutenant Conder, and the second officer in command, Lieutenant Kitchener, were both wounded, as well as the majority of the other members of the party These officers returned to England on the conclusion of the trial held at Acca in October The party will be occupied during the winter in office-work in London, and it is hoped will be able to take the field early next year, so as to complete the trigonometrical survey before the autumn of 1876"

I now turn to Central Asia. Many valuable additions have been lately made to our knowledge of the country between the Russian frontier and Afghanistán Captain Trotter, in the first place, has published full details of the work accomplished by his moonshí, Abdul Subhan, in his 'Survey of the Panjah river from Ishkishem to Wámar in Roshán,' and has added, from native information, several routes leading down the river and across the Pamír, which are entirely new and of the utmost interest.* The course of the river again, as delineated by the moonshí, has been verified, and in part corrected, by the plotting of the route of Colonel Montgomerie's havildar, who at nearly the same time ascended the stream from Hazret Imám to Kileh-Kúm, in Darwáz, thereby furnishing us with a knowledge of the river for several stages above Wood's furthest, and what is of still more importance, determining for the first time the identity of the Surkháb, or Wakhsh, with the stream which joins the Oxus above Hazret Imám, and which, on Wood's authority, has hitherto appeared in our maps as the Wagish By far the most extensive exploration in this region has been made, however, by a Russian Scientific Expedition, which travelled, during the past summer, from Samarcand by Shahar-i-Sabz, and through the famous Iron Gates (which had not been visited by a European since the time of Clavijo) to Hissar, continuing their route by Beljiwán to Koláb, and thus crossing the Wakhsh at the celebrated Pul-i-sangín, where the river is shut in between precipitous rocks, and becomes contracted to a few yards in breadth The Expedition returned from Koláb by Kurghán Teppeh and Kobodián. By combining the results of this Expedi-

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* One of these routes (No. XXVII of Captain Trotter's Report) has supplied me with a most unexpected illustration. The Foreign Office MS Report, which is probably the most curious and elaborate of the whole series of the Klaproth forgeries, contains the account of a route from Kashgar to Badakhshán across the Pamir, which is evidently the very same as that described by Abdul Subhan The following abstract comparison of the two routes, indeed, can leave no doubt

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of their identity, and we thus obtain positive evidence that, however Klaproth may have tampered with his materials in constructing Geographical romances, he was really in possession sixty years ago of authentic information regarding the Pamir, which is not surpassed at the present day

Route from Report, p 163	Route from Foreign Office MS.	Remarks from Ditto
1 Kashgar	Kashgar	Details of route are given, which however cannot be compared Distance 40 versts
2 Tash-balig	Tash-balik	On the Yaman-yar River at the foot of the great hills
3 Bulghar Pass (very high)	Ulu-gerat-daban (or pass.)	Cross the snowy range N W. to Pamir Plateau
4 Moji Chakhar Arghin (Kirghiz)	Tchakhar Aral	Direction, west Cross a river formed of two arms flowing south to (little) Kara-kul Lake.
5 Rang-kul	Khoja Kutchuk	North of Rang-kul
6 Murghabi River	Ak-su River	Aksu and Murghábi are names for the same river
7 Kara-sú	S W to region of Aldjur.	Aldjur is Alichúr Pamír, and the Kara-su is the stream flowing through it N.W. to Ak-su
8 Sasik Kul (two lakes and Pamir)	Lakes Tus-kul and and Isir (Ishil) Kul	The Tuz-kul and Yeshil-kul are the two lakes in the Alichur Pamír, the first is also called Sasik-kul.
9 By Charang and Ghund to Bar-Panjah in Shignan	To Oroshan, Shignan, and Badakhshan.	Down the valley of the Ghund to the Panjah

tion—firstly, with our own surveys of the Panjah and Pamír, secondly, with the work of Fedchenko in the Aláí plain, and, thirdly, with the Russian explorations of the upper feeders of the Zarafshán—we shall be able at length to construct a reliable map of the region between the Upper Oxus and Jaxartes, which will be further improved, if it be true as stated in the Russian papers, that after the complete reduction of Kokand, troops will march from Khojend to Germ in order to bring under control the extensive dependency of Karatègín.

The island of New Guinea has for some years past attracted much attention, and in the future, probably, it will attract still more; for it is almost impossible in the present state of the world, when the nations of Europe have subjugated or colonised so many lands belonging to the Indian Ocean, the China Seas, and Polynesia, that this magnificent island, the queen of the Eastern Archipelago, and immediately contiguous to Australia, should remain much longer in isolated and barren independence. The Geographical Society of course has no direct concern with questions of colonisation or annexation; we merely take note of such matters in consequence of their bearing on our own legitimate pursuit of Geographical knowledge In regard to New Guinea, while the Society has thus abstained from all participation in recent agitation on the subject, we have nevertheless watched with an anxious eye the various maritime surveys which, from time to time, have been executed along the coast-line, and we have further taken an especial interest in the Expeditions that have attempted—hitherto with very limited success—to advance into the interior of the island. The following is a *resumé* of our latest intelligence on the subject of New Guinea exploration The Italian traveller, D'Albertis, notwithstanding the valuable experience gained during his previous visit to the north-western part of the island, has been unable during his present visit to gain a footing on the mainland of the southern side, and has employed himself accordingly, during the last spring and summer, in Natural History researches on Yule Island, whence he has despatched his first collection to Europe. The Expedition despatched last year by the London Missionary Society, under the orders of the Rev S. Macfarlane, has met with great difficulties in its attempts to take the steamer *Ellengowan* up the rivers on the south-eastern side, and in finding a site for a mission station, although it has succeeded in obtaining much valuable information with regard to the Geography and products of that part of the coast We have further learnt by telegram that the Macleay Expedition, of which so much was expected in the Australian Colonies, has returned from New Guinea to Sydney without effecting anything of importance. According to a letter which I have lately received from Mr. Octavius Stone, one of our Associates, who was preparing at Somerset, Cape York, to cross over to New Guinea, with a view of exploring the country, and who had recently fallen in with the Australian Expedition at Errub Island, in Torres Straits, Mr Macleay had failed in effecting an entrance into the Fly river on the western-side of the Gulf of Papua, owing to the dangers of the shore navigation and the hostility of the natives; and on the 13th of August last was about to proceed eastward to Port Moresby. Mr Macleay's steam-launch had, however, ascended for the distance of some 7 or 8 miles up the Katau river, which was believed by the Rev. S. Macfarlane and by Mr. Stone to be one of the channels of the delta of the Fly river, but was unable to proceed further into the interior. The return of this Expedition to Sydney, as we have been informed by telegram, *re infectâ*, will be a great disappointment to the Australian public, and will, it may be feared, discourage for a time the further prosecution of New Guinea Exploration *

Arctic proceedings alone remain to be considered The *Alert* and *Discovery* left England a few days after our last Anniversary with the heartiest wishes, not only of this Society, but I may say of the whole British nation, for their success. They encountered a succession of storms on the outward voyage, but reached Disco early in July without any serious damage. The

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* Within the last day or two I have received further intelligence from Mr Stone, which is of great interest, and of which, accordingly, I add a brief notice. It is the discovery of a river on the south coast of New Guinea, which is navigable for nearly 100 miles into the interior, and which has been actually ascended by the Rev S Macfarlane and Mr Stone, in the London Missionary Society's steamer *Ellengowan*, for a distance of 60 miles. This discovery is communicated in a letter to me from Mr Stone, dated, "Mouth of the Mai-Kassa River, New Guinea, September 7, 1875," and from which I extract the following passage —

"We have found a river navigable for any ordinary-sized steamboat 60 miles in the interior, whose width averages from one mile to one-quarter, and depth from 12 to 3 fathoms It is likewise navigable for small boats to a further distance of 30 miles, making a total of 90 miles, but, by clearing away logs and branches that choke it up at that point, it might be made navigable for many miles further, as the depth at the furthest extremity I went to is 1½ fathom"

It is proposed to call this the "Baxter River," after Miss Baxter of Dundee, to whose generosity the London Missionary Society were indebted for the presentation to them of the *Ellengowan* steamer, by means of which the southern part of New Guinea has been thus, for the first time, explored

Mr Stone has sent us a very interesting report of the *Ellengowan's* voyage of discovery, together with a chart of the Baxter River, which we shall submit to the Society at an early date He had returned to Somerset by the last accounts, and was about to proceed to the east side of the Gulf—Port Moresby—with a view to making further researches.

Valorous followed shortly afterwards, and enabled them to fill up at Disco with stores and coals, so that they made their final start for the Polar basin on July 17th. The commencement of their voyage in this region was most propitious, the ice in Melville Bay, which usually presents a formidable impediment to progress, being so thin and yielding, owing to the icebergs and heavy pack having already floated to the south, that the vessels steamed through it almost without stopping, and reached Carey Islands, where they established their first depôt on July 26th, having only occupied seventy hours in crossing Melville Bay from Upernivik to Cape York. They started again for Smith Sound on July 27th, and according to the cheering report which has reached us, both from Captain Nares and from Commander Markham of the *Alert*, expected from the very favourable state of the ice to be able to reach as high as 85° N. before pulling up for the winter They had indeed at least six weeks of working weather before them when they left Carey Islands in 76° N., and but for the necessity of establishing depôts and leaving records as they proceeded, might thus have almost hoped to finish their whole work, as far as exploration was concerned, in a single season.

I may add that this favourable forecast is fully confirmed by Captain Adams of the *Arctic* whaler, who has just returned from Baffin Bay, having left the whaling grounds on October 20th, and who reports that the season is exceptionally fine, and that there is every indication of a large extent of open water to the northward

The means through which we have been put in possession of this latest intelligence of the Expedition well merits also a special record. Captain Allen Young, the well-known Arctic navigator, started for Baffin Bay a month later than the Government Expedition. His immediate object was to search for further memorials of Franklin, and he accordingly, after touching at the Carey Islands, passed through Lancaster Sound and Barrow Strait, and penetrated down Peel Sound as far as Bellot Strait, where he was stopped by an impenetrable pack Retracing his steps, he again visited Carey Island, and on this occasion discovered Captain Nares' cairn and records, which had escaped him on his first visit. These precious documents he brought with him to England, where he arrived on the 16th of October.

A brief notice of the successful result of the last Arctic Expedition of the Swedes, news of which has just reached England, will bring these remarks to a close. I had occasion to allude to this important undertaking in my Anniversary Address of last May, stating that it was under the direction of the well-known Arctic explorer and savant, Professor Nordenskiold, and equipped at the cost of Mr Oscar Dickson of Stockholm. Its object was the attainment of the mouths of the Siberian rivers, Obi and Yenissei, and the opening up of a trade route, *viâ* the North Cape, to those important outlets to the mineral and commercial wealth of Western and Central Siberia—an object which for centuries has baffled the attempts of the maritime nations of Europe The Swedish Expedition appears to have been completely successful. The vessel found a navigable passage, and reached the mouth of the Yenissei on the 15th of August. Professor Nordenskiold, accompanied by Drs Stuxberg and Lundstrom, quitted it on the 19th, according to previous arrangement, in order to return home overland, and on the 30th of October reached Ekaterinburg at the foot of the Ural.

The Session is now opened, and we proceed to the business of the Evening Meeting. It had been our intention to commence the Session with a paper by Colonel Grant on the subject of Stanley's Exploration of Victoria Nyanza but this has been unavoidably postponed to our next Meeting; and we have accordingly asked Mr Watts to read a paper, which he had already prepared, on his adventurous journey last summer across the Vatna Jokull.

The following Paper was then read by the author.—

Journey across the Vatna Jokull, in the Summer of 1875. By W. L. Watts.

The Royal Geographical Society has done me the honour of asking me to give you an account of the previously unexplored parts of Iceland, which I had the pleasure of investigating this summer

It is a remarkable fact, that although this island is not more than 400 miles from our own shores, it contains no less than from 3000 to 4000 square miles until recently untrodden by the foot of man I refer to the Vatna Jokull, and a much larger area to the north of it which had never been investigated. It was to this district that my work this year was principally confined, and it is to the Jokulls, or ice mountains of Iceland, its fjalls, or mountains destitute of any frozen covering, together with the hitherto uninvestigated districts to the north of the Vatna Jokull, that our attention will this evening be directed

It has been a matter of surprise to me that although we have extended our researches to most of the principal mountain chains of the world, the grand Jokulls of Iceland, with volcanic fire still smouldering beneath their icy surface, should be left in their frozen solitudes to be visited only by the fog and the storm, and that we should possess no definite account of those volcanic wildernesses which lie immediately to the north of Vatna Jokull.

Concerning this district the wildest stories have been current, tradition has handed down the supposed existence of fertile valleys in the heart of Vatna Jokull, and of outlaws lurking amongst the lava crags of the Ódátha-hraun. To this district the volcanic forces of Iceland appear of late years to have retreated, and although terrible volcanic eruptions have been witnessed in the Vatna Jokull and in its immediate neighbourhood, the seat of their occurrence until this year has never been visited. The object of my late expedition was to cross the Jokull in order to determine what it really consisted of, to examine the desolate waste to the north of it, and visit the volcanoes which erupted so violently in the beginning of the present year, one of which had wrought considerable damage in the north of Iceland.

Upon my arrival in Iceland I proceeded first to examine the advancing glaciers upon the south of the Vatna Jokulls, and I found that the part of the Vatna known as Breithamerkr Jokull had recently advanced to such an extent as to threaten to cut off all communication along that part of the southern shores of Iceland

By June 23rd all my men had assembled.

Perhaps a brief description of the necessary equipment for an expedition of this kind may not be out of place. Everything had to be dragged upon hand sleighs, you may therefore suppose that our travelling gear was reduced to the simplest necessities of existence The most important piece of furniture was our bed, a large sleeping-bag 8 feet by 5, one side made of a layer of cork and felt covered with india-rubber, and the other side of thick blanketing covered with mackintosh; this bag was open at both ends, so that three men could lie with their heads one way, and three with their heads the other way. A hood which covered each of the openings completed our sleeping arrangements, and thus we had accommodation for six persons with a weight of only 50 lbs. The warmest method, and that which I invariably use for camping in the snow, is to dig a square hole 3 or 4 feet deep, over which I pitch a tent only 3 feet high, at the bottom of this hole the sleeping-bag is placed. Our provision consisted of pemmican in skin bags, butter, biscuit, condensed soup, chocolate, whisky, which, with a good supply of clothes and moccasins, together with the necessary implements and instruments, completed my equipment.

On June 24th, accompanied by twelve Icelanders, I set out from Nupstad, a farm upon the south base of the Vatna Jokull, and proceeded on horseback up the west side of the valley of the Dmpá, which river finds its way over a lava stream flowing from the Vatna Jokull.

Having arrived at the foot of the Jokull, I sent back my horses under the care of two men, and as it was now evening commenced the ascent of the frozen mass before me.

The Jokull at this point last year was a crevassed glacier, the surface of which was covered with aiguilles and hummocks of sand and ice, now all traces of the glacier were buried beneath a vast accumulation of snow. I was able, however, to use my sleighs, but the snow was very soft, so that our progress was consequently difficult and slow. After about three hours it began to snow heavily; and as we had not done a bad day's work, I decided to encamp, six of us occupying the sleeping-bag I have described, and four, who were to accompany us only a short way, made themselves as comfortable as they could with rugs and mackintosh coats in front of the tent. The morning brought only fog and snow, but as I knew the locality pretty well from my previous attempts, I decided to advance After one hour's dragging, the fog and the storm increased, and in a short time the snow was so deep and soft that it was impossible to get through it, so I was compelled to halt till the surface of the snow was sufficiently frozen to bear us. Weather cleared in the evening, and we again advanced, but the snow by this time was up to the knees. Seeing I was tiring out my men (and as it had begun to freeze, the probability was that in about two hours the crust would be firm enough to travel on), I again halted, and casting up a bank of snow to windward we turned in.

It was bitterly cold, but the atmosphere was very clear. My thermometer registered 20° Fahr. of frost. By 3 A.M. we were again under weigh, it was a lovely morning, the wind north-west, and as the sun illuminated the magnificent snow slopes everything seemed to promise fine weather and success

The sleigh travelled merrily along the frozen surface of the snow until we reached the mountain I last year named Mount Paul—after my head man who accompanied me, both at that time and upon this occasion. Mount Paul is a cluster of one large and several smaller eminences, rising to the height of 150 feet above the surrounding snow. Last year I observed that it rose directly from a larger crater, which was now filled with snow, a semicircular pit being thawed out by the radiation of the sun's rays from the south side of the mountain. Here we found an abundant supply of water. The mountain is composed of varieties of obsidian, varying from a highly vitreous obsidian to the grey stony variety, specimens of which I have before me. One portion of the mountain consisted of vitreous obsidian, cementing together multitudes of the concretionary forms commonly known as spherulite.

At this point I sent back four of my men. The weather was execrable, and for two days it was utterly impossible to proceed. My compass had for some time been almost useless. In thick weather one has to steer principally by the wind, in fine weather a circular piece of card, marked off into four right angles, is the best compass, so that by constantly taking the bearing of the angular position of all distinguishable points one is able to steer a pretty straight course. In spite of the deepening snow we now plodded on, being compelled to rest about every quarter of a mile to take breath, and to clear away the snow from the front of our sleighs. We now encountered a violent storm, and we soon could see nothing but twirling clouds of snow, which wrapped themselves around us in such a manner that it was impossible to distinguish from what quarter the wind was blowing I therefore pitched camp, but with great difficulty, for the drifting snow filled up the hole almost as soon as it was dug.

The storm continued for two days, during which time I put every one upon short rations On the third day I was able to take an observation I perceived two black conical mountains of no great height. one about 5 miles due north, and the other about 11 miles north-west

From this point I obtained an excellent view of the Vatna Jokull Housie, and the snow-covered ridges leading up to its cone were perfectly discernible, they are probably lava streams

An extensive eruption must be appalling from these volcanoes, when any great amount of lava is ejected upon these vast accumulations of ice and snow, but minor eruptions and small streams of lava probably make but little impression. The wind unfortunately soon shifted to its old quarter, and we to ours. This was exasperating to the last degree. Towards midnight, after a brief consultation with Paul, I told my men it was of no use lying still any longer, and as the sleighs could not travel, everything must be made into packs and carried on the back, so, leaving our sleighs behind, we started, wading through the deep, loose, heavy snow. Unfortunately two of my men became ill, which compelled us again to halt The next night we were favoured with a severe frost I therefore sent two men back for one of the sleighs Served out some of Peek and Frean's meat biscuits, and when we started again we made good progress northward. A fog shut down upon us, but the rim of the sun was occasionally visible through it, and bright fog-bows brought up the rear to windward.

We encamped just in time to gain shelter from a hurricane and snow-storm, such as I had never before been exposed to We were at a height of 6150 feet. We took six hours' sleep, and, on looking out, found the storm had subsided, and for a moment the fog lifted, showing three dark mountains to the north—doubtless Skjaldbreith, Herthubreith, and Dyngjufjóll.

The storm soon returned with redoubled fury. I was again obliged to put every one upon half-rations, and at intervals it was necessary to send a man out to clear away the snow from the top of our tent, to prevent it breaking down. It was a trying time, lying weather-bound in that bleak mountain-region, with provisions growing less and less. For three days and nights the pitiless storm beat upon our small encampment, but on the morning of the fourth day our hopes revived, the fury of the storm had beaten the snow hard, and, after serving out some warm soup, I directed everything to be packed up with the utmost expedition.

We ascended for a short distance, and then straight away commenced to descend, and presently at so rapid a rate that I was obliged to order three men to go behind to prevent the sleigh from starting on its own account for the bottom of the mountain Suddenly the clouds cleared away before us, disclosing a deep valley at our feet, and a black mountain streaked with snow at our right. We continued our course till it became obvious that we could go no further in this direction with the sleigh; so, accompanied by Paul, I went forward to explore. The cold here was intense. I felt it severely After having been warmed by helping to drag the sleigh, my hands, which I had been obliged to uncover to take out my field-glass, began to freeze, so I ordered two of my men to beat them with their hands, and directed the other three to put spiked iron clamps upon their feet, that they might steady the sleigh Without this precaution we should most likely have ended our career, sleigh and all, by an abrupt descent into the valley beneath, unless we had been stopped by some of the ugly crevices, that yawned halfway down the snowy steep, upon the precipitous and slippery sides of which we were descending Upon reaching the valley, we found the wind had filled it with light pulverised snow, through which it was most difficult to force our way, as we were all thoroughly tired, I decided to halt. We rested a few hours, and again proceeded, reaching the northern base of the Vatna Jokull, leaving behind us its mysterious recesses and volcanoes so carefully guarded from intrusion by gloom and storm. The snow here terminated in a series of ridges and cliffs of ice, in some instances so covered with débris as to be in no way distinguishable from the neighbouring hills. Before us, immediately to the north, rose a cluster of mountains, from which great quantities of steam were rising and hovering above their summits in a huge mushroom-shaped cloud, to our left and north-west lay a wide-spreading lava field, arms of which stretched among the neighbouring mountains like a troubled ocean of cindery stone, patches of black sand at intervals broke the continuity of this tract of lava, and culminated in a desert still farther to the north-east, beyond all, the weird forms of fire-wrought mountains formed a fitting background, their rude outlines rendered still more uncouth and grim by the fierce storms of ages. A huge tongue of glacier at this point swept down to a distance of some 10 miles beyond its most northern limit, as represented upon the map published by Olsen in 1844, from a survey made by Gunnlaugsson in 1835. I here caught sight of Snœfell, and upon taking its bearings with the smoking mountains, which evidently were the Dyngjufjoll, I found that instead of being at the Kverkfjoll, which was the point I had intended to strike, I was upon the east side of Kistufell, about 9 or 10 miles further to the west. We were astonished at being unable to see anything of the Jokulsà, which, upon Gunnlaugsson's map, rises at the foot of Kistufell. Descending, we found ourselves in a large watercourse, occupied, however, by an insignificant stream, which we easily waded across. No doubt this was formerly the bed of the Jokulsà. The glacier had advanced completely over the route taken by Gunnlaugsson in 1835, thus diverting the course of the river, which now rises in several arms from the extremity of this glacial tongue. At this time we had scarcely more than two days' provisions left, so a series of forced marches were necessary in order to reach the nearest farm—viz, Grimstathir. Steering due north, we crossed a group of low volcanic hills, which were not marked upon the map, beyond these lay a desert of black sand, which the lava of the Ódáthahraun had entered at its south-west corner In the middle of this small desert rose four eccentric-looking eminences, surrounded by a considerable lava field, the greater portion of which was buried in the sand; a closer approach showed them to be small volcanoes, these are situated in all probability upon a fissure in the centre of the plain. I mention them on account of their similarity to the volcanoes which have been formed this year over the fissure in the Myvatns-orœfi, of which I shall speak presently. The lava that issued from these volcanoes is basaltic, or doleritic, and bears a close resemblance to the lava from the Myvatns-orœfi The ensuing morning we reached the main arm of the Jókulsà, here I decided on leaving my tent and the heavier part of my baggage, and strike for Grimstathir. Being thus relieved, we crossed the Svartà (or black river) to the Vathalda Hills. This river rises in the Dyngjufjoll, but is soon lost in the sand, reappearing as the Svartà, which washes the south base of the Vathalda. These hills, although of no great height, command an extensive view to the south towards the Vatna Jokull, which can be easily reached by following one of two valleys, bearing respectively west and south-west. From here I obtained the first good view of Kverkfjoll; it appeared to be a cluster of conical mountains, and one huge crater on the north slope of the Vatna Jokull. This larger crater, although partially filled with snow, was smoking at three points, but presented no other signs of activity, having progressed about a mile upon the Vathalda, we were soon upon the pumice which was ejected last spring from the volcano of Oskja-gjà. It has fallen in a line about 25 miles broad from the centre of the Vathalda to the south of Herthubreith, this pumice has fallen from Oskja-gjà in a band of continually-extending radii eastward to the seashore, destroying in its course six farms in the Jokull-dalr, and injuring others in the immediate vicinity. This shows that the prevalent winds during the eruption of Oskja-gjà must have been south-west. Two nights and a day, with short intervals of rest, brought us to the ferry of Grimstathir, where we obtained a boat and reached the farm of that name. The journey from Nupstad in the south to Grimstathir in the north, occupied us sixteen days, twelve of which were passed among the regions of perpetual snow. I must here remark that nothing could exceed the pluck, perseverance, and obedience of the Icelanders who accompanied me, without whom I could never have crossed the Vatna Jokull.

We rested for three days, and then started for the Odátha-hraun in order to inspect the volcano whence the pumice had been this year erupted. It is situated in the southern portion of the Dyngjufjoll Mountains. I had been unable either to hire or purchase more than two horses, and as my own had not yet arrived from the south we were compelled to start on foot, using the two horses to carry our baggage and hay. I proceeded across the lava and sand desert of the Myvatns-orœfi, to the little river of Gravalandà, upon the banks of which, and those of its neighbour the Lindà, we found good feed for the horses. It was upon the banks of these rivers, beneath the shadow of the snow-capped Herthubreith, that the last of the Icelandic outlaws found a shelter. Herthubreith is one of the highest mountains in Iceland. The banks of the Gravalandà were in places thickly grown with birch and salix, but the larger wood was dead. I have noticed this in many other places. The banks of the Lindà abounded with *Angelica arctura*, the stem and roots of which are decidedly good to eat.

A weary march across the pumice brought us to the little desert where our tent had been left. During the first part of this march we had suffered greatly from want of water, but remembering that the pumice had fallen during the winter, I obtained a good supply of snow by digging through the pumice. I now sent back three of my men with the horses and all superfluous luggage, with instructions to procure a fresh supply of provisions, and to wait for me on the banks of the Gravalandà. I "cached" two days' provision and proceeded to the Dyngjufjoll. I found these mountains to consist of a series of semi-detached sections, some of which had broken out in ancient times, and by their insignificant lava-streams had helped to swell the widely extending lava desert of the Odátha-hraun.

These sections of mountains described a heart-shaped form upon the south, inclosing the Askja This is a three-cornered piece of elevated land 4000 feet high, about 6 miles long and 3 or 4 miles broad, it is easily reached by a glen upon the north-east side of the Dyngjufjoll. The principal crater which erupted this year is situated in the south corner of the Askja.

The crater is inclosed upon the eastern and western sides by mountains rising in some instances 1000 feet above the Askja plain, they appear shorn of their inner faces by the violence of the eruption, forming perpendicular cliffs of great height These cliffs are rapidly falling in avalanches of stone occurring at frequent intervals, and had formed in two places steep slopes of pumice and débris which it is possible to descend; all access to the floor of the crater is prevented, however, by an interior rim of the precipice immediately at the base of the heights. It is well worth coming to Iceland to stand upon the summit of one of the surrounding mountains and look into the yawning crater which opens at one's feet, its grim chasms and black pits all contributing to the general aggregate of steam and loam stench, and horrid sound, while behind stretches a wild waste of glen, desert, and mountain, a country mourning in ashes and howling with desolation

This volcano, which perhaps we may be allowed to call the Oskjagjà (the chasm of the oval casket), does not appear to have produced anything but pumice, mud, and water, copious floods of the latter having evidently flowed from its crater. It is curious to remark that although this volcano has ejected water it is neither a glacial nor a snow-capped mountain, and it is situated more than 100 miles from the sea.

Leaving the volcano of Askja behind us and proceeding in a westerly direction, we perceived that the lava from the Ódátha-hraun had entered the Askja upon its most western side, having run for a considerable distance up hill. Upon descending the Dyngjufjoll to the west, a broad plain, barren and black with sand and lava opened before us, this was the Ódatha-hraun.

There was the snowy mound of Skjaldbreith spotted with protruding lava, with its curious tuft of rock at the top, somewhat similar to that on Herthubreith, further to the east lay Kistufell, by which we first descended into Northerland, and behind, all the white expanse of the Vatna Jokull sweeping the horizon from east to west, where it is apparently joined by Tindafell, Tungnafell and the Hofs Jokull, for from this position we could not see Sprengi Sands We reached Skjaldbreith; it is a mound of basaltic, lava, partially covered with snow, rising to a height of about 4000 feet. Eruptions from this mountain appeared to have taken more the form of prodigious boilings-over rather than that of terrific outbursts. The summit was enveloped in clouds, so I stopped within 300 feet of the top to get a good view of the country. Before me lay the Odátha-hraun to the north-east, Oskjagjà smoking with increased vigour in the clear cool morning air, at a point farther east was the long route which lay between us and the living world, stretching away bleak and bare to where the grey pumice in the distance gave the country the appearance of lying in bright sunshine, to the south was the Vatna, its more elevated crags enveloped in gloom and mist. The pure white Jokull, the black sands and lava-fields, alike cold, bare, silent, motionless, and dead.

We we will now briefly retrace our steps over the wastes of the Odátha-hraun past the fire blasted hills of Dyngjufjoll to happier districts which the volcano and the glacier have still spared to Iceland. While sojourning among the sheep pastures of the north, my attention was arrested by stupendous columns of smoke arising from the direction of the Myvatns-oræfi, and spreading out like phantoms of mammoth palm-trees amid the calm atmosphere of an autumn Sabbath morning. It was in the Myvatns-oræfi that the violent volcanic outbreaks occurred last spring; let us hasten to the scene and see what new ruin is being piled upon the old. Upon emerging from a valley which runs through the hills of Myvatn, a line of some twenty columns of smoke proclaims the seat of volcanic activity; from the north end of these a conical mound about 150 feet in height is erupting with considerable violence, and is rapidly forming a cone within a large crater which had evidently been formed by a previous eruption; a column of cinders is being shot to twice the height of the volcano itself, and a copious lava-stream is flowing from a breach in its most northern side and from a smaller opening at the base of the cone.

The wind is freshening from the west, from which quarter it has fortunately been blowing all day, thus enabling us to gain a neck of land now almost encircled with lava. Within a few hundred yards of the volcano itself showers of fine cinders are falling despite the adverse wind. Fountains of volcanic fire spring with loud explosions from the grim jaws of the volcano, falling in torrents of molten sparks and fiery masses upon its glowing lips and blackened sides.

And now casting a retrospective glance at the long weary road from Nupstad to Grimstathir, which we have been the first to tread since the island of Iceland rose above the waters of the North Atlantic, what do we find? We find that the Vatna Jokull is a mass of ice and snow resting upon a nest of volcanoes; that its glaciers are rapidly increasing, that it is encroaching both upon the north and upon the south; and, granting that the Vatna is a fair specimen of the Icelandic Jokulls, that nothing can save Iceland from the advancing glaciers but a cycle of propitious seasons We begin to recognise what an important effect this huge refrigerator has upon the climate of the north of Iceland, how it shields the northernland from the aqueous vapours which travel upward from more southern latitudes, receiving upon its broad shoulders an inordinate amount of hail and snow. We find the Ódátha-hraun and the country immediately to the north of the Vatna to be a wilderness wherein the seismic forces of Iceland are still keeping up their erratic character by breaking out where least expected First they break forth amid the snows of the Vatna, then amongst mountains which for ages had smothered their volcanic energies, then in the middle of a plain already rendered almost desolate by prehistoric outbursts. This eccentric shifting of volcanic force in Iceland may perhaps be due to the many cracks and fissures which doubtless already exist in the superficial rocks occasioned by the violent earthquakes which have from time to time convulsed the island.

Dr Rae, on being called upon by the President, said that after Mr Watts' experience his own pleasant picnic in Iceland was a very small affair indeed. When the project of a Submarine Telegraph to America was first started, there was a difficulty in laying the cable right across the Atlantic, and it was suggested that the best way would be to lay it piecemeal to the Faro Islands, Iceland, and Greenland, thus having short lengths of about 500 or 600 miles each He was employed to visit Iceland in connection with that scheme He went across a part of the country which Mr. Watts had traversed, and his experience convinced him that Mr. Watts had performed one of the most daring journeys that it was possible to accomplish The Icelanders had a superstitious dread of travelling over old ice, and Mr. Watts had done something wonderful in persuading any of them to accompany him No doubt he would have brought home a great deal more information if he had not encountered such severe gales He himself had taken 14 days to cross from one side of the island to the other, though he had horses all the way The most disagreeable part of the journey was crossing the rivers A recent traveller had said that there were no rivers which could not be forded, but some of them were such as to try the nerve of the most daring man to cross. The water was quite white, no stones whatever being visible, and the only bridges over the rivers that could not be forded were formed of small boxes like tea-chests, swung by pulleys on two ropes. As he was the leader of the Expedition, his people insisted on his always crossing first, and it was by no means an agreeable thing to do; otherwise it was a most charming journey, and anybody who visited the country would be delighted with what he saw Everything was entirely different from what could be seen in any other land. He did not think there was any other part of the world in which so many things could be found which were wholly new The contrast between the great black lava-fields and the ice coming down to them was one of the most curious things he ever witnessed The people were hospitable in the extreme There was one curious mountain which Mr Watts had not time to ascend. It was very steep, and he should have liked to have examined it, but had to hasten round to Reykjavik to meet the *Fox*, which was under the charge of Captain Allen Young He, however, thoroughly enjoyed the journey, and so would every one else who had plenty of time at his disposal Nearly every part of the country could be travelled over with a pony, except the district which Mr. Watts had crossed. Mr. Watts had not mentioned snow-shoes as part of his equipment, but they would have been found very useful if he had taken them Flat sledges, too, would greatly have aided him in passing over the snow The wooden snow-shoes used in Norway were not so well adapted for the purpose as those worn in the Hudson's Bay Territory. When he passed through the country he took the heights all along the route, but never crossed anything above 3000 feet

Captain Allen Young, on being called upon, said he knew nothing of the interior of Iceland, having only taken the ship round to Reykjavik to take up Dr Rae, who made a wonderfully correct report of the land he had traversed. He wished to ask Mr. Watts why he found the compass useless there

The President said the Fellows of the Society were very glad of this opportunity of expressing to Captain Allen Young their gratification at seeing him back again amongst them.

Mr. Watts said the compass was rendered useless in consequence of the magnetic iron contained in the rocks. He took snow-shoes with him, but they were no good when travelling over loose, partially-melted snow. They caused almost more fatigue than wading through the snow, and when this snow was so deep that it rose above the knees, he did not think any sleigh whatever could travel over it.

Dr. Rae said his experience was that, whenever the temperature was below 10° of freezing, sleighs were very useful In the Hudson's Bay Territory he once travelled 1300 miles, over more than half of which his snow-shoes sank from 12 to 14 inches deep, and had travelled days in wet snow, when it was so deep that he could not have got on at all without snow-shoes. A small stick has to be carried to strike the frame of the snow-shoe every two or three steps to shake the wet snow off. A properly-constructed sledge is not very difficult to haul over wet snow.

Mr. Watts said that must have been when there was frost; but during his journey there was a great absence of frost, and the snow being half-melted, snow-shoes were scarcely any good, and sleighs could not be drawn.

Dr Rae said, when the temperature was below freezing-point, a person could always get along better with snow-shoes than without them.

Second Meeting, 29th November, 1875.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Rev. F. C. Jagg, Lieut.-Col. William Tedlie; Alfred E. Craven, Esq.*

ELECTIONS.—*F J. Angier, Esq ; Hon David Arnot; Alatau J. Atkinson, Esq , George Baker, Esq., John Benson, Esq.; William Price Bonnor, Esq , Capt. John Borlase,* J.P , *George Bourne, Esq.; Rev. E. William Bullinger; Rev. William Bullock,* M A ; *Lawson Cape, Esq ,* M.D.; *Archibald Henry Clarke, Esq.; George FitzRoy Cole, Esq.; Edward Coombe, Esq., John W. S. Coward, Esq.,* J.P., *Thomas Adolphus Cragoe, Esq ; William Douglas Robinson Douglas, Esq ; Joseph Henry Duckham, Esq ,* R.N., *William Hamilton Greville Duncan, Esq., Sir Barrow H Ellis,* K.C S I. (Member of Council of India), *Colonel Charles Elliot,* C B., *John Green Elsey, Esq.; Capt. Henry Wemyss Feilden,* R.A. (Naturalist, H M S. *Alert,* Arctic Expedition), *C. F. Gahan, Esq.; William Gayfer, Esq.,* M A., *Lieut. Henry Charles Harford* (99th Regiment), *Augustus Frederic Haslam, Esq.; Colonel Haughton,* C.S I., *Alfred Gutteres Henriques, Esq.,* F.G.S, F.Z S , *Horace Augustus Herbert, Esq.; John W. C. Honeybourne, Esq.; Alfred John Howard, Esq.; Mountney Jephson, Esq.; John Kennedy, Esq.; Daniel W Kettle, Esq., John Knight, Esq.; Joseph Laing, Esq ; Isaac Cowley Lambert, Esq.; Dr Arthur Leared, the Hon. William Littleton, James Irvine Menzies, Esq.; Dr. Munro; S. H. Needham, Esq , William Edward Oates, Esq.; Frederick Oxley, Esq.; Hon. Francis Parker; Colonel Sir Lewis Pelly,* K.C.S.I.; *Capt. Richard William Pelly,* R N., *John Timbrell Pierce, Esq.; Franz Emil Ferdinand Hugo Pohl, Esq ; Capt George T Plunkett,* R.E.; *William Donaldson Rawlins, Esq.,* M.A , *William Charles Roberts, Esq.; John Frederick Russell, Esq.; Sir David Salomons, Bart , Lieut. Gideon C. Sconce,* I.N.; *Henry Sewell, Esq ; Charles Edward Shepheard, Esq.,* C.E.; *Capt. Frederick William Sidney,* R.N., *Howarth Smith, Esq.; Edward W. Stanton, Esq ,* M.A., *Alfred Streeter, Esq ; Alfred Strong, Esq.; James Meliss Stuart, Esq.; Walter Tomlinson, Esq.; Wesley Henry Thomas, Esq ; Andrew Macpherson Walls, Esq ; J. H. Ernest Waters, Esq.; Lieut. Joseph Watson,* R.N R.; *Joseph Weedow, Esq.; George Hampden Whalley, Esq*, J.P., *Edward D. J. Wilson, Esq.; John Smith Wilson, Esq.*

His Excellency Nubar Pacha, Minister to His Highness the Khedive, was elected Honorary Corresponding Member of the Society.

DONATIONS TO THE LIBRARY, FROM 15TH TO 29TH NOVEMBER, 1875.—Relacion Historica del Viage a la America meridional por Don Jorge Juan y Don Antonio de Ulloa, 5 vols. 4to., Madrid, 1748 (*J. P. Gassiot, Esq., jun.*). Hakluyt Society's Publications, vols xxv., xl, xlii, xlvii, xlviii., and lii (*The Society*). Hydraulic Manual, by L. D'A Jackson, 1875, Spirit levels taken in the Punjaub since 1863, 1869, Spirit-levelled heights, Section IX, 1871–72, Abstract of Reports of Surveys in India for 1871–72, Report on the Caoutchouc of Commerce, by J Collins, with Memorandum by Dr Brandis, 1872, General Reports on Revenue Survey Operations, Bengal Presidency, Upper and Lower Provinces, for 1868—1873, General Report of Topographical Surveys, Bengal Presidency, 1867–68, General Report on Topographical Surveys of India, 1868—1873, Magnetical and Meteorological Observations, Bombay, 1865—1870, Archæological Survey of Western India, Belgâm and Kaladgi districts, by James Burgess, 4to, photographs, 1874, Census of Bombay Presidency, 1872, part III., Report of tour made by Colonel E. C Ross from Shiraz to Bushire, with route-map, 1875; and Selections from Records of India, Foreign Department, No. CXX. (*H.M. Secretary of State for India*). Nebraska, by E A Curley, 1875 (*Author*). African Slave Traffic, by H B Cotterill, 1875 (*Author*). Report of Corporators of Boston Railway Company, 1875, and Fourth Annual Report of Board of Railway Commissioners, 1873, Boston, U S A (*E. Jarvis, Esq.*). Grundprincipien der arktischen Forschung, von Carl Weyprecht, Triest, 1875 (*Author*) La première Campagne de la Crimée, par A. Layard, traduction par A. E. S Jervis, Bruxelles, 1855, and The Anthracitic Coal of Demonte, by W. P. Jervis, 1875 (*Chevalier W. P. Jervis*). British North American Boundary Commission, Report of Geology and Resources of the Region in the vicinity of the 49th parallel, by G. M Dawson, Montreal, 1875 (*Author*). Tide-tables for British and Irish ports, 1876 (*The Lords Commissioners of the Admiralty*). Life of Sir Roderick I. Murchison, by A Geikie, 1875 (*John Murray, Esq*) The English Historical Library, by W. Nicolson, 1714 (*Walter Rye, Esq.*), and the current issues of corresponding Societies, &c.

DONATIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF NOVEMBER 15TH, 1875.—Route-map from Khartoum to Obeiyad, by Commander

Prout, 1875 (*General Stone*). Map of the Department of Ancachs Peru, by A Raimondi (*A B Wyon, Esq.*)

On Mr H M Stanley's Exploration of the Victoria Nyanza. By Lieut.-Colonel J A GRANT, C B

THE journey recently made by Mr H M. Stanley, the commissioner of the 'Daily Telegraph' and 'New York Herald,' is one of the most important and brilliant that has ever been made in Central Africa, or, indeed, in any other country For, when we consider that he accomplished it so quickly, taking only nine months from the time he left England, it seems at first as incredible as was his famous discovery of the late Dr Livingstone It is not alone the short time, but the great geographical question which he has finally settled—namely, he has confirmed Speke's discovery, that the Victoria Nyanza was one vast inland fresh water—he has navigated its shores for a thousand miles, thereby proving that its waters are continuous

Before remarking upon Mr Stanley's two letters, dated the 1st of March and 15th of May last (a third letter has arrived through Egypt, dated 12th April, 1875), I may allude to the knowledge we had of the great Lake previous to the time when Mr Stanley visited it

The lakes of Central Africa were known to geographers as far back as the year 833, for in 'Tabula Almamuniana' of this date, also in Abul Hassan's map of 1008, we have the Nile rising from one Lake "Lacus Kura Kavar," and in the latter map we have mention of M Komr (Mountains of the Moon) at lat. 7° s Several old maps, showing the lakes with their effluents, have been referred to in Lelewel's Géographie du Moyen Age,' and may be classed as follows.—

1154	Tabula Rotunda Rogeriana	Have 3 Lakes and 3 Rivers
1274	Ib'n Said	
1331	Ismael Ab'ulfeda	
1274	Ib'n Said	„ 1 „ 3 „
1311	Bernardi Sylvani	„ 2 „ 1 „
1501-4	Charta Marina Portugalensis	
1507	Iohannes Ruysch	
1529	Diego Rib'ero	„ 3 „ 1 „
1529	Diego Rib'ero	
1540	P Apianus *R Gemma* Frisius	

Other more modern maps might be quoted, but during the last century map-makers seem to have left out all the lakes of Central Africa, and it is only in the last fifteen years that the centre of Africa has again been studded with its lakes.

In the year 1857, the London Geographical Society sent Captains Burton and Speke, both officers of our Indian Army, a service which I had the honour of belonging to, to explore Africa from Zanzibar *viâ* Lake Nyassa, to Egypt Thus it was that we first heard of Lakes Tanganyika and Victoria.

Captain Speke, in 1858, went twenty marches north of Kazeh, alone, with (?) seventeen natives, to test the Arab rumour that a great ocean, which they called a bahr, or sea, existed He found that the Arab traders had informed him correctly, a lake of almost unbounded extent stretched away from him to the north, there was, he was told, as great breadth of it on his left hand as there was on his right He returned to England and presented his map of the discovery of the Victoria Nyanza to this Society, accompanying it with his belief that the waters he had seen were those of the Nile—but this had yet to be proved The President for the time was the late Sir Roderick Murchison, who at once grasped the subject, and said, "Speke, we must send you back again"

Many months' preparation for his next expedition passed slowly to Speke, but at length, in 1860, he and I started from Zanzibar with 200 followers It will give some idea of the fickle African when I tell you that we had only 40 men of the 200 when we reached Kazeh, 430 miles west of the sea-coast Three-fourths had deserted us We need not, therefore, be alarmed by the report of Mr Stanley that one-half of his men were non-effective He will enlist others, or do with fewer

Months of weary delay again took place on the way between Kazeh and the hilly region of Karagweh, on account of the difficulties thrown in the way by the inhabitants We wished to get on quickly, and tried to march near the Lake, but were told that the ordinary route *viâ* Usui must be kept We accordingly went that way, and crossed the watershed at 2½° s lat From this position we descended the northern incline of Equatorial Africa, and never left Nile-land till we reached the Mediterranean

After leaving Karagweh, the country, bounding the Lake on the west and north, to the capital of Uganda, may be generally described as a plain 4000 feet in altitude, but worn away at intervals of from 1 to 10 miles, with narrow excavations made by streams falling into the Lake. The route may be likened to the teeth of a saw, the points being plains and the depressions swamps We had extensive views of the Lake from these plains; seeing its bays and islands, but no peaks nor distant ridges nor mountain-cones to the east, nothing but a clear sea-horizon was visible, and no native could tell who lived beyond this sea

The bays and long inlets of water or friths, seen by us on the western and northern shores, were M'werooka, Katonga, Murchison, &c Some were completely land-locked, and 20 miles in length; I allude to the one seen near our camp at Uganda capital. It is here, probably, that Colonel Long, of the Khedive's service, found himself the other day, when he reported that Speke's Victoria Nyanza was merely a small affair of 30 miles in extent. What a prize he had at his feet!

The largest island I observed was that of Sesseh at the north-western corner of the Lake, by compass-bearing it was 40 miles long, the width could not be taken with any accuracy from the shore, but it appeared only 3 or 4 miles It has no hills, is low in the water, and at one point I observed its shore to be within a mile of the mainland. The King of Uganda keeps his fleet of canoes here, and consults with the God of the Lake, who resides on this island.

It was mentioned last season, at one of our meetings here, by Sir Samuel Baker, that he was given to understand the native name for the Lake was Sesseh. Petermann, in a comprehensive map published this autumn, has followed this mistake by calling the Lake Sessi See, as well as Ukerewe, and Victoria Nyanza I explained that Sesseh was a large island, and am glad to have my statement confirmed by Mr Stanley, who has found it to be the largest island on the Lake. Various and numerous were the other islands seen by us, but they were nearly all uninhabited, and of no importance

The greatest river on the route between the most southern point of the Lake, round its western and northern shores, is the Kitangule Kagœra in the district of Karagweh. It rises probably from the foot of the conical mountain of M'f'oombiro, supposed by us to be 10,000 feet high, numerous lakes and valleys send their waters to it. In appearance it has a slow, majestic, winding course, which is navigable for 30 to 40 miles from its mouth, vessels drawing 25 feet of water could, I believe, float at the ferry where we crossed Speke and I had to conjecture this depth at the ferry, because we were forcibly prevented from dropping our lead-lines into it the King would not be pleased, it was not "canny" to take soundings

I should not be the least surprised to hear that Mr Stanley selects this noble river as a point for exploration. With the *Lady Alice* he can ascend this stream from the Lake up almost to King Rumanika's door, or he can cross over the mountains of Ruanda and Urundi and descend to the spot on Lake Tanganyika, where

Livingstone and he had such a pleasant picnic; or he may select the Albert Nyanza as his field for exploration. All will be new to us, either route would interest geographers intensely, for the country, its people, and its animals are all unknown

Leaving the river Kitangule, and proceeding north to the capital of Uganda, a distance of 125 geographical miles, we counted five-and-twenty streams, varying in depth from 3 to 10 feet, which we waded, swam, or crossed by bridge, there were numerous other smaller ones which would not give trouble even when flooded. They were mud-coloured and mud-sided—swamp rivers, in fact

The area of the Lake, according to Speke, who took latitudes and longitudes for its western half, and only had native information for the other half, is 645 geographical miles in circumference, and if we add to this the circumference of Lake Bahr-ingo, now said to form a portion of the Lake, we have 910 geographical miles. Speke, therefore, after his last journey in 1860–3, made the Victoria Nyanza out to be of an area not equal to Lake Superior, which is 1500 miles in circumference, but parallel in size with Huron (600) and Erie (650)

You naturally ask how Speke came to make the Lake the size it has proved to be There was no theory in his statement, as you will allow when I state that, at Muanza, along the west side, and on the north, he had taken its latitude, longitude, and altitude Native travellers had gone, *by water*, from Ukereweh to Kitangule, and onwards to the capital of Uganda, also onwards to Baringo. We travelled by the western side, where the country is without mountains, low and swampy, and when Captain Speke got to the Ripon Falls, the natives told him there was as much water, from where he stood, to the East, as there was to Katonga Bay in the West, where he lately came from Therefore it was by these measurements that he made the Lake the size it has proved to be by Mr Stanley.

The only point where water was observed to leave the Lake was at Ripon Falls, in Uganda Here the body of water is 150 yards wide—the depth was not calculated—but this quantity bears but a small proportion to the contents of the Lake. As to the depth of the Lake, I am inclined to the belief that Stanley's measurement will show it is a comparatively shallow body of water, resting on a vast plateau; that there is no chasm such as Tanganyika is formed of Stanley has given us only one measurement for depth—275 feet, and had not taken the centre of the Lake. The Nile, after leaving the Lake at Ripon Falls, has a navigable course to the

Karuma Falls From here to the Albert Nyanza its course is through rock and over high falls. We have yet to learn the exact position of the river as it leaves the Albert, but it is again navigable from this to Apuddo, the village near M Miani's tree, hence it again foams over rocks for some distance, and at intervals, as it runs below, and north of the Jubl Kookoo Mountain range Colonel Gordon has, however, found it navigable farther up from Gondokoro than was suspected, namely, up to 12 miles south of Regiaf, whence all the way to Egypt—*during high Nile*—for 1620 geographical miles there is no obstruction to a boat drawing 5 or 6 feet of water

Many will remember the enthusiastic reception given in old Burlington House where Speke and I were received after telegraphing that the "Nile was settled;" that "the Victoria Nyanza was the source of the Nile" Such a reception certainly awaits Mr Stanley when he appears here, and if he should make more discoveries—which he undoubtedly will if God spares him—there is no honour which this Society can bestow that he will not have earned over and over again. He, as an observer, a traveller in its real sense, a provider of true and pleasant pictures from unknown lands, has confirmed the discoveries made by Speke, and to him the merit is due of having sailed on the broad waters of the Lake, and sent home a map, and descriptions so vivid and truthful that the most sceptical cannot fail to be satisfied

Here it may be as well to explain that some geographers never accepted Speke's Lake as one great ocean, although the geographical world did The foremost of unbelievers, and the one who appeared first in the field, was Captain Burton, the companion at one time of Speke He did not seem to have any reason for his argument. He said there must be several lakes, lagoons, anything, in fact, except *the* Lake Even the late Dr Livingstone and Mr. Stanley made out there must be several lakes Livingstone wrote in a very patronising tone, "Poor Speke had turned his back upon the real sources of the Nile"—"his river at Ripon Falls was not large enough for the Nile"—and was disparaging of Speke's discoveries. The work of Dr Schweinfurth, the 'Heart of Africa,' has fallen into the greatest blunder Also, nearly three years ago, a map, constructed by Mr Keith Johnston, without authority, in our map-room, was suspended from these walls, but, on my protest, the President Sir Henry Rawlinson ordered that it be altered to the delineation of the Lake by Speke. This was done.

Numbers of other writers and map-makers, Continental and English, have gone on disintegrating the Lake from book to book, map to map, and from year to year, but I think the public will now perceive how unjust the above critics have been, how firmly the fame of Speke has been established, and will not fail to accord him that place in their opinions which he may have lost for a time.

The following published maps exhibit the Victoria Nyanza divided into two or more lakes —

'The Nile Basin,' by Richard F Burton, 1864 Coast-line delineated only at south extremity of Lake, and the south side of the islands Kerewe and Mazita, from the Kitangule River to the Katonga, at Murchison Creek, at Napoleon Channel Between these is placed the words "Supposed Site of Victoria Nyanza" Bahari 'Ngo made a distinct lake

'Lake Region of Eastern Africa,' by A Keith Johnston, 2nd edition, 1872 Victoria Nyanza, a continuous coast-line from Napoleon Channel, along N and W sides to Urundi, on E coast, coloured only as water at the S. extremity, and round the islands Kerewe and Mazita, from a little S of Kitangule River to a short distance E of the Katonga, about Murchison Creek, about Napoleon Channel The eastern side made a distinct lake, with the name 'Bahari ya Ukara' Lake Baringo entirely separated from the Victoria Nyanza

'Dr Livingstone's Routes, 1866 to 1872;' map in 'Ocean Highways,' July, 1872, by A Keith Johnston Victoria Nyanza, a continuous coast-line as above, with the islands Kerewe and Mazita, forming a peninsula from the E shore, water shown only from Napoleon Channel to the Kitangule River, about the southern part of the Lake and the peninsula, along the E coast with the name 'Sea of Ukara' Lake Baringo quite distinct

'How I found Livingstone,' by H M Stanley, map by E Stanford, 1873, S of equator only Coast-line of Victoria Nyanza only delineated, and water coloured at Jordan's Nullah, a little past Muanza, the Bengal Archipelago, and S side of Kerewe and Mazita Islands, from opposite Mashonde to the equator, on E side about Kaverond of Wakefield's map, with name 'Sea of Ukara.'

'Livingstone's last Journals,' 1874, map of the Forest Plateau of Africa, by E Stanford From E of Muanza to Ripon Falls the W. and N coast of the Victoria Nyanza is shown as delineated by Speke, but with the opposite coast generally parallel to it, at a distance of 30 to 50 miles, with the name Lake Okara; E of the S extremity of this Lake is placed another, 60 miles long by 50 broad, named Kavirondo, and connected with Lake Okara by the Kidette River Lake Baringo is also detached, and communicates with the Asua by the River Ngardabash.

In Sketch-map of Dr. Schweinfurth's routes, 1868–71, by E.

Weller, in 'The Heart of Africa,' by Dr Schweinfurth, a series of five distinct lakes of small extent, connected by rivers, takes the place of the Victoria Nyanza. Of these, Lakes Ukara and Ukerewe, respectively the E. and S extremes of the Victoria, are named Lake Bhari Ngo is quite separate (drained by the Asua), receiving at the N the waters of Lake Zamburu, by a river from its S extremity, which last receives the waters of another lake, not named

Besides these, I might also mention —

'Sud Afrika und Madagaskar,' by Dr. Petermann, No 45 of Stieler's Hand-Atlas, 1872 In this, 'Ukerewe' (Victoria Nyanza), 4308 feet (?), is shown according to Speke, except that there is no E coast marked, Lake Baringo is also omitted

In Colonel Long's map of his visit to M'tesa and the Victoria Nyanza, published by the Chief of the Staff, Egyptian Army, the Lake is shown to have a width of only 20 miles from the N coast.

It is now my place to make some comments on Mr Stanley's journey.

Starting from Zanzibar, in the month of October, 1874, with 300 followers, he made a rapid journey of 720 miles to the south-east corner of Victoria Nyanza, performing this distance in 103 days, inclusive of halts Through forests, across deserts and rivers, he conveyed the boat, *Lady Alice*, in sections, and launched her on the Lake. The forethought and energy required to convey this boat must command the fullest admiration, for in doing so, he has navigated the Inland Ocean, and given us a thrilling account of its extent, its rivers and shores, and its beautiful islands.

He experienced almost stunning losses and privations in his land journey. Having to travel through sterile, unhealthy regions, the want of food and water was felt severely, his men suffered from sickness—death was rife amongst them—and he had to contend against the Waturu race, who sounded their war drums, and killed twenty-one of his men. After contesting with them for three days, and clearing a way for his advance, he continued his march towards the Lake. In his letter of the 15th of May, allusion is made to a fight from his boat with the Wavuma race, but as no particulars are furnished, the account may be in the correspondence sent *viâ* Uganda to Egypt * The Island of Uvuma at the north-end of the Lake, is the position mentioned.

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* This correspondence has reached England since the above was written The people use slings, a fact which corroborates what we learnt in Uganda.—J A G.

On the 27th of February last he obtained his first view of the great sea, and it can be imagined how impatient he must have been, and how hard he and his men must have worked to put the *Lady Alice* together, to have a short trial on the Lake before taking to sea in her. There are many questions which we should like to ask Mr. Stanley here, but we must be content with his map now before us, with its rivers, islands, and broad expanse of water.

Of the rivers which he observed during his voyage round the south, east, north, and west coasts, he gives, commencing with the most southern and proceeding northwards, the Monunguh, Luwamberri, and Duma, these three join and form the Shimeeyu The Ruana falls into, Speke Gulf, and is made 90 miles in length. Fifty miles farther north comes the Mara, 70 to 80 miles. Twelve miles north there is the Mori, then in succession, the Shirati, Gori, Ugoweh, and Yagama In all, ten rivers are in the map. The only one described—the Leewumbu, or Shimeeyu—seems to be the only important river. It rises in 5° s. lat, and 35° E. long, runs a course of 170 miles, where it and two others join to form the Shimeeyu, which extends for 100 miles farther. The width of the Leewumbu in the dry season is 20 feet, and depth 2 feet. Mr. Stanley gives great importance to the Shimeeyu, saying its course is roughly 350 miles, that it is one mile wide at its mouth, and 400 yards across above the mouth This river may prove to be the most southern waters of the Nile. But the river Ugoweh, at the north-east corner of the Lake, must be a considerable stream also, for hippopotami were seen in it. No remarks are made on the other streams.

We therefore have but one great stream on the whole length of the eastern shore of this great Lake, and we know that on the western shore there is the same coincidence, namely, the Kitangule-Kagoera, the only river which obliged us to cross by canoe. The River Katonga we heard much spoken of as a troublesome stream, but I do not think it can be navigable from the bay.

It seems as if the great brown plains, which Mr Stanley speaks of as bounding the Lake to the east, drank up all the rain that falls upon them. Everywhere he heard of plains to the east; even the "Towering Table" mountain of Majita or Mazita, east of Ukerewe Island, was seen to be surrounded by plains; also the island-like mountains of Ururi, Uramba, and Shashi, they, too, had their plains, but all these being within a radius of 40 miles (*vide* map), I take it they are remains of an old plateau, being 3000 feet above the level of the Lake. There is a similar table mountain at Cheysimbee (mentioned in Stanley's map) on the opposite coast, but it is only 400 feet above the plain

The mountains of Ugeyeya are called gigantic, for Mr. Stanley says, "We pass between the Island of Ugingo and the gigantic mountains of Ugeyeya, at whose base the *Lady Alice* seems to crawl like a tiny insect, while we on board admire the stupendous summits." There is nothing as to size or summit on the other side of the Lake to compare with this description of the equatorial mountains of Ugeyeya. This seems to be rather a mountain region, for, to the east of the "Bridge" or Basalt Isles, a "flat and slightly wooded district, varied at intervals by *isolated cones*," was visible from the summit of the Isle Manyara, at the north-east angle of the Lake, on the eastern side of the bay, is "a land of bold hills and ridges, while the very north-eastern end, through which issues the Yagama river into the Nyanza, is flat"

Having examined all the notes on the mountains of the east coast, we can say that there are no mountains, no volcanic cones, to be compared with them as to their height and *proximity to the Lake* on the west coast, where the whole country is flat from Kitangule, north, and the streams run to the Lake like hare-soup down a tilted plate, leaving deep furrows in the plain We saw several long valleys which, no doubt, once were "friths" in the Victoria Nyanza, they are silted up, thousands of acres of land on the west coast are in this state. I therefore cannot but conclude that the fairway of the Lake will be found on the east coast, and that the miles of swamps and shallow water in the west do not exist to the same extent on the other shore But this interesting question will, I trust, soon be settled when we receive Mr Stanley's observations on depths.

No fewer than sixty to eighty islands may be counted upon Mr Stanley's map, dotted generally in clusters all round the shores, at distances of 2 and 3 miles from the mainland The largest in the whole Lake is Sesseh, which we made 40 miles in length Mr. Stanley makes it 35 × 25 Passing to the south of the Kitangule, we have Bumbireh, 25 × 8, and following the curves of the Lake, Ukerewe, 32 × 7; Ugingo, 20 × 5, Usuguru, 22 × 5; and Uvuma, 15 × 10. The remaining islands are small in comparison to those mentioned here, and the majority of the islands are near the northern shore, at the end where the waters leave for Egypt, and the others are chiefly by the shores of the southern third of the Lake.

If we examine the areas of the islands mentioned above, for instance, Sesseh—or, as Mr. Stanley calls it, Sasse—it has an area of about 700 English square miles; the dimension of this one island will give some idea of the importance of this inland sea, which is probably the largest body of fresh water—*at this altitude*—in the known world

Captain Speke attached the Lake Bahr-ingo to his lake at its north-east corner. Rev T. Wakefield places it 50 miles detached from the Lake, but Mr Stanley inquired of the natives regarding it, and was told there was no Lake in that direction However, considering that the native information obtained by the two former gentlemen has proved to be correct in most cases, and that it was obtained independently, on this account I do not give in to the non-existence of the Bahr-ingo Lake. He mentions that the River Ugoweh joins the Lake here, and is of considerable size. Hippopotami were seen there by him, and it may be the water communication which Speke heard of as connecting the Bahr-ingo with the Nyanza There is also the Yagama here *

Regarding the altitudes taken by Mr. Stanley, we find that in leaving the desert plain of Ugogo, he ascended to another plateau, 3800 feet, again, as he proceeded north-west, he came on a still higher one of 4500 feet, and his greatest altitude was 5100 feet, which is the watershed between the Lake and the sea-coast. This last height corresponds with the highest *inhabited* country Speke and I traversed in our journey, namely, the capital of Karagweh, which approaches to within 50 miles of the w s w end of the Lake.

The height of the Nyanza above the sea was 3550 to 3650 feet by one aneroid, and 3575 to 3675 by another A further observation by Mr. Stanley, with two boiling thermometers, made the altitude, subject to correction, similar to Speke's, namely, 3808, or 68 feet in excess of Speke's observations. The difference is insignificant, and we may accept them as the established altitude of Victoria Nyanza.

Mr Stanley found that his latitudes along the Uganda shores differed from Speke's by an average of 14 miles. This difference of 14 miles may be accounted for, as suggested to me, by his having forgotten to apply the semi-diameter of the sun to his observations. It should also be taken into consideration that the sun was close to the Equator when he observed for latitude at noon, and that, under such circumstances, the observation would be a very doubtful one. His longitudes varied little. In one instance, that of the Katonga, Stanley made it 16 miles north latitude and on his map 22, while

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* Since the above was written, another letter from Mr. Stanley states that Baringo begins north of Ugeyeya, is a country 15 miles of latitude, with deep land-locked bays "Thus hereabouts almost a lake is formed separate from the Victoria Nyanza" This is very important, as it confirms Speke's statement that Baringo was connected by water with the Victoria Lake.—J. A. G.

Speke's observation was a few miles south of the Equator The two observers observed differently; but this is no reason for discrepancy. Mr. Stanley took the sun at noon with a sea-horizon, and made an observation for longitude in the afternoon He cannot understand how Speke—who was on shore—observed, unless it was by double altitude of the sun, but I can give the explanation Speke took his latitudes by observing the meridian altitude of suitable stars with an artificial horizon, and generally found a star of the first magnitude for his purpose. At Katonga he had Capella and Canopus (both first magnitude) Indeed, while in Uganda, it will be seen, from the following, that he used no others The observations were checked by the fact that he was travelling north at every stage; his dead reckoning would correct him. I cannot see how to account for such a blunder, for I have the fullest confidence in his observations —

					′	″
31st January, 1862,	at Meruka, by star	(1st Mag)	Capella	Lat	36	2 S
1st February, 1862,	at Sangwa	„	Capella	Lat	30	47
2nd „	at Masaka	„	Capella	Lat	20	2
6th „	at Kituntu	„	Canopus	Lat	7	40 S
9th „	at Nakusi	„	Capella	Lat	7	15 N
10th „	at Kibibi	„	Capella	Lat	15	0
12th „	at Nakatema	„	Capella	Lat	17	55
13th „	at Niamagoma	„	Capella	Lat	17	15
25th „	at Bandowaroga	„	Canopus	Lat	21	19

Speke never rested satisfied with an indifferent observation, he repeated it by another star on the same night or following opportunity, so that he took many more observations than are recorded, and only registered those which gave him confidence.

At the stations immediately south and north of the Equator he observed as follows for longitude and variation. —

3rd February, 1862,	at Masaka	5 altitudes and 3 compass bearings
4th „	at Masaka	3 distances.
10th „	at Kibibi	10 altitudes and 7 distances
11th „	at Kibibi	12 altitudes, 5 distances, and 1 com-

The area of Victoria Nyanza, as made known to us by Mr. Stanley, proves that Speke far underrated its extent. I have carefully measured the maps of both travellers with compass to ascertain their existing difference, measuring every 10 miles, and the result, by this rather rough means, obtained is as follows. The map in Speke's book was the one measured from —

Circumference of Speke's Lake ..	645	geographical miles.
„ Stanley's Lake	890	„

If we add 265 geographical miles, the circumference of the

Bahr-ingo Lake in Speke's map, we get 910 miles as one body of water—a curious similarity, in circumference, to Stanley's single Lake—only 20 miles of difference

Mr. Stanley thinks the mode of spelling Nyanza is objectionable, because he says the natives do not pronounce it in this way. Let me first explain that in using the expression Lake Victoria Nyanza, we actually say Lake Victoria Lake—Nyanza signifying Lake. All that is necessary, when using the word, is to call it the Victoria Nyanza, or Victoria Lake. As to the spelling and pronunciation of the word, we find that it is sounded differently in different localities, and different people spell it differently.—

In old maps	Nianja, of 3 syllables
In Livingstone	N'yassa, of 2 „
1863 Speke and Grant	N'yanza, of 2 „
1870 Rev T Wakefield's Sadi	N'yanja, of 2 „
1875 Mr H M Stanley	Niyanza, or Nee-yanza, of 3 syllables

Nyassa, Nyanz-a (nasal *n*), and N'yanja, have a more liquid sound than the three-syllable word of Nee-yanza, and we found the Waganda and Wanyoro pronounced it by the method adopted by us

Some allusion may be made to the names of the countries which were observed by Mr. Stanley on the east and north-east shores of the Lake, trying, by comparing them with the routes given by the Rev. T Wakefield, to find similarity or identification; but, after a close examination, I have failed to dovetail the routes of the latter with Mr. Stanley's names. Sadi, Mr. Wakefield's informant, was correct in describing the extent of the Lake, and conjectured that the northern stream from Lake Bahr-ingo "enters the Nyanza to the northwards," but, as already stated, Mr Stanley found the country of Baringo almost land-locking an arm of the Victoria Nyanza at the place where Speke had his Baringo Lake.

The only names which tally are given below, and I leave it to others to make farther inquiry —

Wakefield's Map	*Stanley's*	*Speke*
	Shashi	Ushaki
	Ururi	Urudi
Kavirond	Kavirondo	
Ukara (Mainland)	Ukara (Island)	
Ugeyo	Ugeyeya	
	Uvuma (Island)	Uvuma.
	Usoga	Usoga.
	Manyara	Amara.
	Bumbireh (Island)	Umbiré (Mainland).

Few, indeed only one in Speke's case, of the above places were visited either by Sadi or Speke, they were obtained by inquiry from natives, and their positions are tolerably accurate when compared with the same places fixed, I presume, astronomically by Mr Stanley.

I should like to call your attention to the skilfully executed maps which are before you one representing the map of Stanley upon that of Speke, the other reducing Stanley's map to Speke's latitudes and longitudes. They are the work of Mr. Turner, the Assistant Curator in the Map Room of our Society He has pointed out to me that if we compare the latitude and longitude given in Stanley's letters with those in his map, they differ in 11 instances, and from 5 to 18 miles

Allusion may be made to two statements in Mr. Stanley's letter of the 12th April, that M'tesa was King of Karagweh, Uganda, Unyoro, Usoga, and Usui, and that he observed a positive tide in the Luaserri during the morning, for two hours it flowed north, and two hours south, he was told that this is peculiar to all the inlets on the Uganda coast

As regards the former, we found that although M'tesa had great influence over the rulers of these places, sending his men as far even as Zanzibar, he was king only in his own country, which extends properly from the Katonga to Unyoro and Ripon Falls, where alone the true Waganda live Regarding the tides, we remarked none in the Lake or any portion of it, and I attribute the motion he observed to the wind blowing down the Lake.

In concluding these few remarks on Mr. Stanley's journey, I may state that they are made on my own authority by request of the President of the Geographical Society, for I felt that it was not for me to come forward as the champion of Speke, he required no such bolstering, in fact, I should have preferred that some other and more competent hand wrote a comment on Mr. Stanley's journey. However, I have great pleasure in complying, for it has opened up to me an old love, and given me this opportunity of congratulating the Society on the great achievement before them. Who amongst us would have had his energy? Who would undertake a cruise in an open boat and absent himself from his camp for fifty-eight days? Who would risk such danger to life and exposure to an African sun in the month of April? Who of us are able to guide, provide for, lead and attend to a little army successfully, and, in the midst of all this, take their observations for latitude and longitude? I think him a worthy representative of the energy which sent out such an expedition

Sir **Samuel Baker** said, when the older African travellers, like himself, were placed on the retired list, one great pleasure still remained to them—to watch the efforts and praise the energy of those younger explorers who were following in the paths which the older ones had marked out He had come up to the present Meeting from the West of England, at some personal inconvenience, on purpose to render all the praise that an old African could to the immense energy displayed by Mr. Stanley At the same time he always felt great pleasure in meeting other African travellers (because the younger ones must not be supposed to extinguish the old lights), and there was now present the oldest African explorer — Captain Burton He had always advocated fair play among them, and though there had been some little rivalry between them, he was perfectly certain that nearly every traveller who had started from this country had done so with the honourable ambition of carrying out what he considered to be his duty to this Society, and above all, his duty as representing the integrity and determination of Englishmen Captain Burton first of all started with Captain Speke Both Captain Speke and himself (Sir Samuel) were comparatively young men when they first met on board the "P and O" Company's steamer. Speke was then preparing for his first expedition to Africa The next time he met Speke was in latitude 5° N., when he was with Colonel Grant, after they had marched through Africa and had arrived at Gondokoro He had never had a greater pleasure, and he hoped he might say the same for them, than that meeting afforded On that occasion Speke left in his hands what was almost like his will—namely, his sketch-map of the country he had traversed, pointing out the Lake Luta Nzige as still remaining to be explored—and this he (Sir Samuel) carried with him throughout his long and arduous first expedition Upon his return he had the honour of handing that map to Sir Roderick Murchison, at Burlington House, as the testament of Speke, who was then dead, and of explaining to the Society that he owed the greater portion of his success to it That original map was now in the possession of the Society, and as he had always supported Speke's view, it was a proud moment to him to find that it had been verified almost to the letter by Mr Stanley All must regret, that in this hour of triumph Speke was no more, but his fellow-traveller, Colonel Grant, and all his family, must feel that this day added to Speke's undying reputation He was exceedingly pleased to find that the reports of the natives to himself had been more or less verified by Mr Stanley's discoveries. Many persons might have forgotten the discussion that took place in that hall, in January, 1874, upon the report that he had received from King M'tesa's envoys, who told him that there were two great lakes, one being named Sessé, that there was a channel between them, and that it was a day's hard work for a canoe to pass through Colonel Grant stated that Sessé was an island, and that, therefore, there must be some mistake. Mr Stanley's account, however, had shown that there was no mistake It was most natural for the natives to describe the portion close to M'tesa's capital north of the island as the Sessé Lake, just as Mr Stanley had heard that Bahringo—instead of being a lake, as Speke thought—was a country As they called the water near Sessé the Sessé Lake, so they called the water near Bahringo the Bahringo Lake. They were perfectly right in saying that there was a channel, and that it was a day's journey for a canoe to pass through into the second great lake. This showed how careful travellers must be in receiving geographical information from the natives; though Burton, Livingstone, Speke, Grant, and himself had done their best, there still remained some disputed points. At the same time, there was always some truth in native hearsay, if it could only be ferreted out All must be struck with Mr Stanley's candour in the letters which he had sent home It was not at all necessary for him to write about the fights and the bloodshed that occurred between him and the natives. There were, however, certain people at home who were very fond of sitting down and criticising That was a most unfair thing for those to do who had no knowledge of the necessities of the case In those wild countries there was no law but the law of force, but he was perfectly certain that nobody travelling for this Society or for this country would ever dream of using force that was not absolutely necessary Still there were some persons who, for the sake of cavilling or of trying to take the gilt off a man's achievements, would find fault with the actions of travellers It had now been proved that Speke and Grant were perfectly right in saying that the river issuing from the Victoria Nyanza was the Nile, although they did not pass along the Nile the whole of the way down Colonel Long, of Colonel Gordon's Expedition, had been up to M'tesa's, and had published a map, which had been very properly criticised by Colonel Grant Of course Colonel Long did not mean to take the wind out of Speke's sails, but he had certainly taken the water out of the Lake, for he said it was only 15 or 20 miles broad Of course that was utterly absurd, but at the same time he stated that he had found the sources of the Nile in some enormous lake near Unyoro He (Sir Samuel Baker) had been there, and knew that at certain times of the year the whole of that country was in the same state as some parts of England had been in during the last few months If the natives of Africa had been in the neighbourhood of Bridgwater during the last fortnight, they would have shown on their maps a very large lake as existing in the centre of England Stanley had not only proved the enormous size of Victoria Nyanza, but also the great difficulty of navigating it with hostile tribes on its shores People at home had no conception of the difficulties that Mr Stanley must have encountered in carrying the *Lady Alice* through Africa and launching her on the Lake He admired that feat almost more than anything else that Stanley had done, because he himself took out two boats, but never managed to get one of them near the Albert Lake, for he could get nobody to carry them, and down to the present time neither of them had been put upon the Lake The difficulties that Mr Stanley had met with would, he was afraid, close the road to any missionaries or others who might wish to travel there, for the natives appear to have a peculiar, British antipathy to strangers, which recalled to his recollection a picture that appeared in 'Punch' some years ago—a picture of two colliers in that civilised part of England near the collieries they saw a tourist, and one of them said to the other, "Jack, who is that?" the other replied, "Why, he's a stranger," and Bill exclaimed, "Then heave half a brick at him" No doubt the natives thought Mr Stanley was a tourist, and, instead of heaving half a brick at him—for they had no such civilised missiles—they used a sling, and Mr. Stanley was actually slung at, which verified the native accounts given to Speke and Grant, "that the inhabitants of the east shore of the Victoria Nyanza made use of slings" It was now proved beyond doubt that the Victoria Nyanza was a great basin receiving affluents, varying in magnitude, from both east and west, and that from that great centre the Nile issued and fell into the Albert Nyanza There was a little passage in one of Mr Stanley's letters which struck him as a slight inaccuracy, and he was sure that on reflection Mr Stanley would regret that he had written it hurriedly After being in M'tesa's country only five days, he wrote an admirable letter to the 'Daily Telegraph', but when stating that the King received him with great splendour, he added that M'tesa had a body-guard "composed chiefly of Baker's renegadoes" If he had said that Baker was his body-guard it would have been easy to prove an alibi, but the "renegadoes" touched him to the quick, because that was a reflection upon his good and faithful soldiers. In fact, he never lost a single man as a deserter in all those countries. Some people supposed that blacks were not capable of any virtues, but his black soldiers were the perfection of fidelity. At the same time, Mr. Stanley remarked that Baker's name was in bad odour with all that he met. He was exceedingly proud to know that his name was in bad odour, and he thought the Meeting would reciprocate the feeling, when he told them that the body-guard, which Mr. Stanley described as "renegadoes," were the dispersed slave-hunters, and he hoped his name would be in bad odour with the slave-hunters for many generations to come Mr Stanley left England before 'Ismailia' was published, and he, therefore, knew literally nothing about the Expedition which he (Sir Samuel Baker) had led Stanley had never been within 150 miles of the country which the Expedition had been sent to, and had only been in M'tesa's territory five days Many years ago, when on his first Expedition, he (Sir Samuel) had profited by the great advantage of having had predecessors who had left good names behind them These predecessors were Speke and Grant. Therefore M'tesa sent his envoys to him, though he was too ill with fever to see them. On his second Expedition the King knew him perfectly well, and knowing the immense importance of gaining his friendship in the search for Livingstone, his first object was to make an alliance with M'tesa, who had ambassadors in every part of Africa within many weeks' journey of his capital So effectual were the representations then made to him, that he sent out two special Expeditions, entirely of his own good will, to search for Livingstone, and was quite prepared to succour him. Cameron met the envoys at the fifth or sixth degree of south latitude, and received the letter that he (Sir Samuel) had written to Livingstone That very letter had been sent back to England, and was now in his possession again People who merely read books of travels often did not see the pith of the work that had been done, and the greatest work that was done by the last Expedition was the opening up postal communication right through the country to Zanzibar. He had given orders to M'tesa, that if any white man should come from the south (expecting Livingstone), he was to pay him every possible attention, as he would be a British Consul, and in fact, a great man in England Stanley appeared from the south, and, naturally enough, M'tesa thought Stanley was Livingstone, and had beaten his big drums and called out all his big people Stanley had thus received the favourable welcome which any white man coming from the south was sure to have received with such an introduction.

Captain Burton remarked that Mr Stanley had had the rare happiness of satisfying both the contending parties—those who believed that the Victoria Nyanza of Speke was a single lake, and those who were of opinion that the area covered by it consisted of one great lake and several smaller ones. From the accounts of the Arabs in 1858–9, he (Captain Burton) laid down the Lake as 240 miles in length by 80 miles in breadth. In his publications he would only allow the part to be put in which had been actually surveyed, and he considered that he was right in taking that course In a subsequent volume on the sources of the Nile he also inserted the parts that had been actually seen His objection was not to the size of the Lake, because the Lake that he had laid down was just as large as the one navigated by Mr Stanley, but to a lake with three or four distinct outlets Speke had marked Mazita as an island, but following the assertions of the Arabs, he (Captain Burton) had put it on the map as a headland, as was now proved by Mr Stanley to be the case. The existence of lakes to the north-east, and possibly to the east of the Victoria Nyanza, was still extremely probable The Mombas missionaries had heard of the Isamburu Lake, and of a volcanic region that was far too distant from the coast to be fed by sea-water, and too far from the Victoria Nyanza to be connected with that lake. He still regarded it as possible that the Tanganyika might be connected with the Nile. Sir Samuel Baker had stated in his last most charming book that he had very precise details from the Arabs and natives about a water-passage between the Tanganyika and the Albert Nyanza. Dr. Livingstone had also seen the current in the former flowing north for some months. Since then Lieutenant Cameron had discovered the mouth of the Lukuga. He could only say that he did not believe in Central African lakes with two outlets, but at present the evidence was that Tanganyika in the dry season was still water, but that in the rainy season it shed its water to the north and west He would not say that that was impossible, and he still lived in hopes that by some curious possibility the Lukuga would be found to be the ultimate source of the Nile In conclusion, he expressed his heartfelt sorrow that his old companion, Speke, had not been spared to be present at this great Meeting No man would have been more delighted to see the corrections that Mr Stanley had made with regard to his wonderful discovery of that magnificent water that sent forth the eastern arm of the Nile.

Mr **Edwin Arnold** (of the 'Daily Telegraph') thanked the speakers for the encomiums they had passed on the labours of Mr Stanley, and the Meeting for the applause with which they had received them. If it were possible for him to communicate at once with Mr. Stanley, he was sure that a copy of the speeches just delivered would cheer and aid him more than beads, or boats, or provisions, or anything else that could be sent him He also thanked the Meeting on behalf of the proprietors of the two allied papers which had sent out the Expedition He read from a private letter addressed to himself the last words that Mr Stanley had written, and that had arrived in this country These were, "I am in perfect health, thank God the Nile sources and their atmosphere make me stronger and stronger, and increase my energy, my last word to you is *en avant!*"

Mr **Hutchinson** (Secretary of the Church Missionary Society) said the subject of sending a mission to Central Africa had long occupied the attention of his Society It was owing to their missionaries that Geographical enterprise was first started on the eastern shores of Africa, and the Society now honestly contemplated the possibility of responding to the call which Mr. Stanley had forwarded from the King of Uganda No doubt there were great difficulties in the way, but every possible care would be taken and every detail carefully planned They did not anticipate so much hostility from the natives as Sir Samuel Baker had spoken of, and they hoped that Colonel Gordon's Expedition would be of great assistance in ultimately opening a route to Uganda One friend had given 5000*l*, and another had promised 3000*l*, showing that there was a feeling in the country in favour of honest and earnest efforts to carry the Gospel to the natives in that part of the world

The **President** said Mr Stanley had been much more fortunate than travellers in general Almost all others, especially in Africa, had had to wait for the end of their labours before getting the credit for them, but Mr Stanley, fortunately for Geography and for himself, had been able to substantiate a great claim on the consideration and the applause of Geographers by the work which he had already done in connection with the Victoria Nyanza; though that was only part of the work which he had in hand From the Victoria Nyanza he would prosecute his researches farther towards the west, and in all probability he would repeat on the Albert Nyanza the same achievement which he had carried out on the Victoria Nyanza.

Sir Henry then read the following notes relating to Colonel Gordon's Expedition

Progress of Colonel Gordon's Expedition.

From the early part of the present year down to September, Colonel Gordon has been employed in the very arduous work of bringing his boats and a steamer up the part of the Nile above

Gondokoro, which is obstructed by cataracts and rapids, establishing at intervals military stations on the banks of the river to secure his position against the hostility of the courageous and warlike Bari tribes. The part of the river thus obstructed is about 100 miles in length, from the Station Regiaf, to a point near Apuddo, named Makédé, whence the Nile is apparently navigable up to its outlet from Albert Nyanza

On the 31st of July Gordon had reached, in his slow progress, a station which he named Kerri, 34 miles above Regiaf He reports himself as then making arrangements for the passage of nuggers (native boats) and his steamer, the *Khedive*, 108 tons, and 20-horse power, up the rapids at Gorgi, having already, with some difficulty, passed the nuggers through the Kerri passage He had with him about 80 soldiers and 130 women and children

On the 2nd of August, he writes —"A day of agony to me. Dreadfully fatigued, mentally and bodily, getting the nuggers up the Gorgi rapids, 2½ miles from Kerri At one point the current came down on both sides of a rock, and tore the mast out of one of the nuggers Nobody was hurt In hauling the vessels up the slopes of water, 60 or 80 black, satin-skinned natives pulled on each rope The Reis says the rapids are not worse than those below Khartum, only there the channel is known." He hoped, he said, soon to get to the friendly Madi Locquia tribe, as the hostile Bari, amongst whom he then was, were treacherous and brave. The natives, indeed, seeing their difficulties, had ceased to help, thus driving Gordon to the necessity of "taxing them," as a punishment.

On the 6th of August he got the nuggers up the rapid and went out to reconnoitre, but he adds—"The Reis made a bad knot to secure the nugger, the rope slipped and down she went Had to haul her up the rapid again, have to look to everything myself. Sent orders to the steamer, 'break her or bring her up.'"

By the 14th of August he had reached the station Laboré, Mountains about 8 miles west of the river The Bari, who occupy about 40 or 50 miles of country on the right or eastern bank of the river, showed symptoms of alarm and hostility

On the 22nd of August he writes as follows.—"The Makédé party came in (from the south) Natives were observed reconnoitring Linant came from Makédé, distance 40 miles Linant had met Stanley at M'tesa's, he had been there eight days. M'tesa is ostensibly on bad terms with Kaba Rega, but really on good terms · Kaba Rega attacked Linant near M'rooli, where he had previously attacked Colonel Long He threatens Foweira, and was informed by M'tesa of the departure of both these officers."

Linant came in on the 23rd, and on the 24th Gordon crossed with him and 30 men to the right or eastern bank of the river. The natives beat drums and collected about 300 men, they lay down, Colonel Gordon says, on the grass, and then rushed in, but were repulsed. He tried to speak to them, but they would not come near He then marched to some rocky hills, the natives attempting to surround the party there, but were again repulsed They showed great courage, however, and came within 90 yards, creeping on their bellies, amidst a shower of bullets

On the 25th Gordon went to look for the steamer by the west bank He saw her and crossed over, returning with one soldier by the right bank, in considerable danger without knowing it Gordon's station, at this time, was on the left or western bank Linant proposed to go the next day (26th) across the river, and drive back the natives, and burn their villages, and, fearing lest they might molest the steamer in the east passage, Gordon agreed, sending with him 36 soldiers, 2 officers, 3 irregulars, and 2 boxes of ammunition Each man had also 30 rounds in his pouch. They started at 8 A.M, crossing the river apparently to the right bank A few shots were heard now and then About noon they were on some low hills, $1\frac{1}{4}$ mile from the station. Linant was visible in a red shirt, they appeared quite at home and stayed there till 2 P.M At half-past four Gordon went for a walk, but was recalled by a shot from the station. With his glass he saw 40 or 50 natives running towards the river-side on the opposite shore. He thought they were running down to look at the steamer, and they retired when fired at. About ten minutes after one of the soldiers appeared without his rifle in the same vicinity. A boat was sent over for him, and when asked why he had left the others, he replied, they were all killed, having fired away all the ammunition in their pouches, while the spare boxes had been sent back. At this time Gordon had only 30 men at the station of Laboré, and 30 more lower down at Moogi Ninety men were in the steamer; but he had no means, as he supposed, of communicating with them, having given the steamer orders to come up by the eastern passage, between which and the stations was a long island. He had, in consequence, to retreat in the night by the west bank from Laboré to Moogi, and, to his delight, found the steamer had disobeyed orders, and was coming up the west channel. Only four of Linant's men escaped, he himself was killed by two lance-wounds, one in the neck and one in the back The natives thus captured thirty-three Snider and Remington rifles, but it was believed they had no ammunition It was the same tribe that had, in 1872, killed Taib Agha's force of twenty-eight men and one officer.

His plans for the future were as follows. He was desirous of enlisting Niam-niams for service against the Baris, and for this purpose it was necessary to go in support of a party of the former tribe to Makraka, eight days' march from the river to the west, a station being established midway between Dufflé and Makraka, among the friendly tribe of Fijiontee. Before starting, however, on this expedition he intended to cross the river, in order to recover the bodies of Linant and the rest of the party, then to recross and make good his way to Makédé by the left bank, establishing a post midway From Makédé, or the neighbouring point of Dufflé, he would strike west to Makraka, and, after settling with the Niam-niams, would return to Makédé. He calculated that two months would be occupied on this expedition, after which he would ascend the river from Makédé to Magungo, on the Albert Nyanza, and subsequently continue his march up the Nile (Speke's Somerset River) to Foweira and Rionga, above the Karuma Falls, which posts he would strengthen for defensive purposes, using them as a base for further operations against Kaba Rega at M'rooli, and ultimately, if necessary, against M'tesa of Uganda He would also have to make arrangements, he says, for establishing communications between Foweira and the Lake—that is the Victoria Nyanza, but he had abandoned the idea of exploring the Albert Nyanza during the present season After Linant's death Gordon was left alone, without European officers or companions His steamer, at the latest date (September 10th) was at Moogi, a little below Laboré, and he says he has not the least doubt but that it would be able to overcome the Makédé Rapids, and thus get into the Albert Nyanza.

Later letters from General Stanton continue the report of Gordon's proceedings up to September 16th, at which date his "taxing" operations seem to have been eminently successful; two divisions of the Bari tribe, against which these operations were principally directed, having already made their submission.

The PRESIDENT then, in allusion to the criticisms to which Sir Samuel Baker had been subjected since his return from his last Expedition, read the following extract from a recent letter of Colonel Gordon, which showed, contrary to what had been the impression in some quarters, that the present chief of the Upper Nile Provinces of Egypt valued the labours of his predecessors —"You may rest assured that whatever may be said to the disparagement of your proceedings, there will remain the fact that you have done more for these countries than any living man can or will do hereafter, and History will never put my puny efforts in any way near your own."

Sir **Samuel Baker** said his great fear at the termination of his last Expedition was lest he might have as a successor one who would neglect all that he himself had done He was, however, certain, from what he knew of Colonel Gordon, that it would be impossible to find a man more peculiarly adapted by nature, constitution, and character for the work than he. That his constitution was fitted for it was proved by the fact that he still remained at his work after the whole of his staff had been invalided home or buried. He was also a man of such truly Christian frame of mind, that he had gone out, as he, Sir Samuel had done, with only one idea, that of doing good, unfortunately, however, the natives were so obtuse that those who wished to benefit them were unable to work as they would wish It was impossible to obtain carriers there, and therefore Colonel Gordon had been compelled to give up all idea of adopting the land route, and tug the steamer up the rapids. The steamer was of 108 tons, and with enormous labour he was taking her past the frightful cataracts in the hope that the navigable portions of the river, forming reaches of about 20 miles each, might form a chain of stations, and so by degrees he might reach the Albert Nyanza. He had no doubt that object would be successfully accomplished. The Albert Nyanza and the Tanganyika formed one immense ravine 1500 or 1800 feet lower than the general level of the country He had recently learned from Captain Burton that the palms on the shores of the Tanganyika were the same as those on the banks of the Albert Nyanza, and that seemed to afford a connecting link of vegetation between the two The natives at the northern end of the Albert Lake had assured him that it was possible to pass from one to the other, but that the channel between them was so intricate that no European could follow it without a guide. The enormous flow of *confervæ* that Livingstone had noticed on the Tanganyika might account for the choking up of the channel, and he himself had seen miles on miles of vegetation floating on the surface of the Albert Nyanza. He trusted that Mr Stanley would be able to solve the mystery

The **President**, in conclusion, expressed his belief that the exploration of the Albert Nyanza which was left for Mr Stanley would be of still greater interest and importance than that of the Victoria Nyanza If the Albert Nyanza and the Tanganyika were pretty much on the same level, it was quite possible that if there was a channel between them the stream through it might vary in direction according to the season That might explain the discrepancies between the accounts of different travellers

ADDITIONAL NOTICES.

(Printed by order of Council.)

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1 *On the Progress of the Arctic Expedition to the 17th of July, and the Return Voyage of the 'Valorous.'* By C R MARKHAM, C B., F.R.S., Secretary R.G.S

[In a Letter to SIR HENRY RAWLINSON, dated at sea, August 28th, 1875.*]

LEAVING Portsmouth on May 29th, we had a pleasant passage to Bantry Bay, which we left on June 2nd, the *Alert*, *Discovery*, and *Valorous* being in company. The officers had not been a day on board and together before the 29th, but all soon settled zealously to their work, each, in his place, preparing to do his share and to help his comrades to the utmost For the first day or two, after leaving Bantry Bay, there was a fair prospect of a good passage, but on the 4th of June it began to blow from the west, and during the whole voyage the expedition encountered contrary winds, with very heavy weather No Arctic Expedition on record has had so long or so boisterous a passage across the Atlantic Yet there were countervailing advantages The ice was being blown out of Baffin Bay. All the gear aloft was thoroughly tried, most of the iron gimcracks—chain topsail-tyes, patent trusses, patent reefing and furling-gear, iron trysail masts, &c—carrying away Things were shaken into their places down below, too Sea-boots and fur-caps were served out during the first week

The very bad weather began on the 11th of June, when the north-westerly wind increased to a gale, with occasional violent squalls On the 12th it fell calm, with a heavy swell, but on the 13th all three ships parted company during a gale of unusual strength, undoubtedly part of a cyclone travelling rapidly to the eastward

The *Alert* was steering north on the south-east side of the circular storm, the vortex of which was moving to the north-east The wind was consequently from the north-west, freshening rapidly with violent squalls and a high confused sea; in the evening it was blowing a whole gale, with the barometer falling rapidly Green seas were coming in fore and aft, and both ward-room and lower deck were flooded She was evidently very close to the vortex of the storm, and at 10 P.M. the barometer had fallen to 28 82°. Nares then wore round, and she took in a green sea over the stern Almost simultaneously the wind shifted to the north, showing that the *Alert* had been within a very short distance of the vortex, and that she was now on its western side. The barometer began to rise again, but the gale from the north continued through the night. The skids over the quarter-deck, with three boats on them, worked very heavily, and one of the beautiful whale-boats, hoisted up to davits on the starboard side, was stove in and destroyed

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* Read at the Geographical Section of the British Association, Bristol, August 31st, 1875

On the 17th there was another gale of wind from the north-west, which continued to the 20th, heavy seas coming in over the forecastle and waist, and washing fore and after. The cutter was nearly lost, a sea striking and half filling her A succession of gales continued until the 26th, when the *Alert* was at length to the westward of Cape Farewell, and steering up the west coast of Greenland. It was on the 27th of June that the first ice was seen Egerton was officer of the watch, and charging a formidable block, he was the first to make the ship touch ice, at 5 P M On the 28th the *Valorous* was sighted off Cape Desolation, and during the following week the ship passed close along the Greenland coast, sighting all the peaks and headlands, and the entrances to fiords From daylight until 10 A M the *Alert* was passing through a stream of very heavy floe-pieces, and she sustained several severe bumps, which brought her up all standing Some of the pieces were two or three hundred yards long, others were evidently fragments of pressed-up hummock-ridges, from 30 to 40 feet high Many were worn into fantastic shapes, the wash of the sea having frequently worked laterally into the ice-blocks, until they consisted of two floors connected by ice-pillars of the deepest blue. The prevalence of westerly winds, and the distance from the coast, at first made me think this stream of ice was a portion of the middle pack, but I now believe it was old ice streaming round from the east coast of Greenland, with the current described by Admiral Irminger The ship was clear of the ice before noon, and in the following night a gale of wind came on, and a heavy confused sea, with perpendicular waves, which made her roll gunwales under, and ship seas over stern and forecastle The 1st of July was a lovely day, and the *Discovery* was sighted some miles inshore, for the first time since we were parted during the cyclone of June 13 She had also lost a whale-boat, and her other boats were more or less injured After the 1st of July the *Alert* and *Discovery* proceeded up the coast in company, passing Sukkertopfen on the 3rd, Holsteinborg, with all its dangerous outlying reefs and rocks, on the 4th; and the grounded icebergs, off Rifkoll, on the 5th In the morning of July 6th the *Alert* and *Discovery* anchored in the harbour of Godhavn or Leively, at the south-west end of the island of Disco, the *Valorous* having arrived on the previous Sunday evening, July 4th

I received a letter from Allen Young, at Bantry Bay, asking me to arrange for 40 or 50 tons of coal being dug out ready for shipment, when the *Pandora* arrived at Disco, which he expected to be about the 20th of July. Immediately on arrival at Godhavn, I begged Mr. Krarup Smith, the Inspector of North Greenland, to cause the necessary arrangements to be made, and he very obligingly took prompt measures to ensure compliance with the request I left a letter for Allen Young, at Godhavn, and so did Captain Nares, giving information as to where letters and records would be left by the expedition When I reached the Ritenbenk coal-mine in the *Valorous*, on July 17th, I found that a party of Eskimos had been at work since the 12th, under the orders of an old Danish overseer, who, curiously enough, was an old acquaintance of mine, having been in charge of the Whale Fish Islands when I was there in the *Assistance* in 1850 A gang of rather pretty girls was digging away at one of the coal-seams, while the men were fishing in their kayaks. I was thus able to watch and superintend the work for some days, which consisted of clearing away the overlying shale, so as to lay bare a large surface of coal I left another letter for Allen Young at the Ritenbenk coal-mine, and I trust that the *Pandora* will successfully reach the North Water of Baffin Bay, visit the Cary Islands and Cape Isabella, and bring back welcome letters and the latest news of the Arctic Expedition.

The Arctic Expedition was at Godhavn from the 6th to the 15th of July, busily engaged in filling up with coals and provisions from the *Valorous*, and receiving most hearty and cordial assistance from Captain Loftus Jones and his officers. The *Alert* had 178 tons of coal on board when she left England, and had expended 44 on the voyage, she thus had 134 tons left, and received 66 from the *Valorous*, making a total of 200 tons Of this, 114 is steaming-coal, sufficient, with an expenditure of 4 tons a day (the quantity required for a rate of 5 knots an hour) for 29 days' steaming, the remainder, 86 tons, is for cooking and warming The *Alert* also took in 3300 lbs of salt meat, 5500 of biscuit, 8000 of preserved meat, 18,000 of flour, 4000 of sugar, 1400 of lime-juice, &c, nine sheep, a harmonium, two boats (a whale-boat and jolly-boat), and Captain Loftus Jones's little canvas coracle The *Discovery* filled up in the same way, and there was nothing that the officers of the *Valorous* were not ready to supply, from a topmast to a teapot

The Inspector of North Greenland, and Mr Elborg, the Governor of Godhavn, were also most anxious to furnish all the aid in their power. They had received orders from the Danish Government respecting the supply of dogs, and 24 good Greenland dogs were ready for embarkation at Godhavn, and 20 at Ritenbenk

The island of Disco is, in several respects, an excellent locality for acquiring a first impression of the Arctic Regions and of their flora and fauna, while the geology presents points of special interest It is here that the volcanic formations overlie the gneiss, and the gorges present very characteristic sections, which, with the mineralogy of the basaltic and gneissose rocks, were carefully studied by the officers of the expedition Here, also, there were special advantages for studying Arctic physical geography, the effects of frost and ice upon the rocks, the influence of summer rivers, glacial phenomena; and those connected with the formation, drift, and breaking up of icebergs From the summits of the Lyngmarken Fjeld, 2300 feet above the sea, there is an enchanting view of Disco Bay, dotted with hundreds of bergs, and the fiord of Jacobshavn, with its great discharging glacier, is visible in the far distance. The Arctic officers eagerly examined and studied these phenomena, climbing the treacherous basaltic mountains, exploring the wild gorges, and crossing the flooded torrents Icebergs were visited in the offing, and the coast at Ovifak, whence the Swedes carried off the now famous meteoric stones in 1871 The valleys and gorges of Disco, in their gay summer-clothing of mosses and wild flowers, furnish an excellent example of the *flora* of both North and South Greenland, both of the plants which will become familiar to the explorers further north, and of the less hardy species which do not occur beyond this parallel Of the 206 species which compose the Greenland flora, upwards of two-thirds were collected by the officers of the expedition round Godhavn, who were thus enabled to form a practical acquaintance with the plants they are likely to meet with in the unknown region. Disco is also an exceptionally good locality for commencing the acquisition of a knowledge of the polar *fauna*, for here the Arctic and the Sub-Arctic forms meet. The great northern diver, razor-bill, puffin, harlequin-duck, merganser, wheatear, and some others, are seen at Disco, and not further north: while nearly all the true Arctic forms were met with Dr. Moss, who is an excellent microscopist and an officer of varied scientific attainments, examined many organisms brought from the surface-water of Davis Strait, and the contents of a dredge from 30 fathoms on the Torske Bank, making admirable coloured drawings of all the microscopic organisms that were new to him

Captain Nares issued a very judicious memorandum, addressed to Captain Markham and the officers of the *Alert*, while we were at Godhavn, with reference to their scientific labours. In order to render the scientific results of the expedition as valuable as possible, he expressed reliance upon the co-operation of each member to assist in forming collections of and in preparing natural history specimens. While the most important specimens will be required hereafter for the general national collection, any supplementary collection will, after a proper inventory is made of it for publication in the general account of the voyage, be at the disposal of the collector Any paper or description, composed for the information of any learned Society, will be forwarded to its destination, through the Secretary to the Admiralty, by the earliest opportunity, as an original paper by the writer.

Commander Markham, and Lieutenants Giffard, Archer, and Fulford, were fully occupied with magnetic observations during several days, obtaining satisfactory independent results for dip and variation Captain Nares and Lieutenant May fixed the position of Godhavn and made a survey, while Mr. White and Mr Mitchell, the photographers of the expedition, obtained a dozen excellent negatives Mr Whiddon, the Assistant-Paymaster of the *Alert*, returns home, and young Egerton, in addition to his regular work, has undertaken the important and responsible duties of Paymaster, including the preparation of depôts, and all the calculations connected with provision and clothing supplies

The 24 Godhavn dogs were taken on board the *Alert*, with an Eskimo dog-driver named Frederick, and his kayak It is intended to engage Hans for the *Discovery*, who is now at Proven. On Thursday, July 15th, at 4 45 P M., the expedition left Godhavn, the *Alert* towing the *Discovery*, and the *Valorous* following The crows' nests were in their places, and the boats (no longer on the skids, as when crossing the Atlantic) were all hoisted up to davits.

The surface of Disco Bay was like glass, and was all dotted over with icebergs of great size and most fantastic shapes, while to the north rose the basaltic cliffs forming the south shore of Disco, resting on the yellow sandstones of the miocene period, which contain coal At midnight on the 15th the *Alert* passed close under the landward face of a magnificent iceberg—a cliff of dazzling white—the top covered with gulls, which flew up in a great cloud. On the other side the berg rose to a peak 200 feet high, under which there was a grand arch, the inner sides being of a deep rich blue The sea was smooth as glass, and the sky, seen through the arch, was crimson tinged with gold. As we gazed upon this scene of wondrous beauty, the *Valorous* hove in sight through the arch, her dark hull and tall masts standing out against the sky. In another hour there was a dense fog, which cleared away towards morning, disclosing a fine panoramic view, with smooth sea and cloudless sky. On the left were the high basaltic rocks of Disco, with the opening of the Waigat full of icebergs, ahead the lofty mountains of the Noursoak Peninsula, and to the right the gneiss cliffs and precipices of Arve Prins Island.

Passing the settlement of Ritenbenk, the expedition anchored in a deep fjord extending to the foot of the central chain of Arve Prins Island The *Discovery* here received her 20 dogs, good serviceable animals. During the afternoon of July 16th, Commander Markham, with Lieutenants Parr and Egerton, and Dr. Moss, took a party of men in two boats to Swarte-fugle Bay, on the north-west coast of Arve Prins Island, where there is a "loomery," and shot 75 looms and razor-bills, sufficient to supply officers and men with excellent fresh meat for two days.

The *Valorous* was to sail at 4 the next morning, and proceed to a place on the Disco shore of the Waigat to dig for coal, and the discovery ships were to follow two hours later The 16th of July was, therefore, the last day on which the gallant explorers would see any of their countrymen, and here I took leave of them.

The *Valorous* sailed from Ritenbenk at 4 A M. on July 17th, the *Alert* and *Discovery* following at 6 A 1 P M. the *Valorous* anchored off the coal-bearing cliffs on the Disco side of the Waigat. From the hills above the cliffs there is a magnificent view of icebergs streaming out of the Tossukatek fjord, at the head of which there is a great discharging glacier, and among them the Arctic ships could once more be seen, under all plain sail, over on the Greenland side of the strait. They were standing down the Waigat (the *Alert* leading) appearing and disappearing behind the huge icebergs At 5 P M. the *Valorous* hoisted a signal at all three mast-heads, "Farewell! Speedy return!" It was not seen for a long time, but at last the *Discovery* hoisted, "Thank you," and afterwards the *Alert* ran up the affirmative pendant They continued to stand on, and were just about to disappear behind a point of Disco Island when, at 6 15 P M, the *Alert* hoisted a signal to the *Discovery*—"Do you wish to communicate?" A few minutes afterwards the *Alert* went about, apparently intending to beat up to windward and communicate with the *Valorous*, and at 6 30 P M she hoisted a second signal to the *Discovery*—"Optional Beat to windward"—we thought it was Then a fog suddenly sank down on the water, and hid both ships from view. This is the last that was seen of the Arctic Expedition. When the fog rose again, towards morning, the *Alert* and *Discovery* were not in sight The intention of communicating was probably abandoned when the fog came on, and the Arctic ships must again have stood down the Waigat, and proceeded on their way to Upernivik They would probably have reached that place on the 21st, and, having shipped Hans and his family, would be in Melville Bay by the 23rd of July

The news respecting the weather, received from Mr Krarup Smith and other Danish officials was encouraging The last winter was very much colder in South Greenland than in the north, owing to strong westerly winds from America In North Greenland the winter was unusually mild, and much ice kept drifting south until March At Godhavn the mean temperature of the winter months was 5° to 13° Fahr higher than the average But the spring was more severe than usual The inferences are, that an unusually large quantity of ice has been drifted out of Baffin Bay, but that there was a check, owing to westerly winds in the spring, consequently, that this is a favourable season for navigation late in the summer, but not in the early part, and that it would have been a mistake for the expedition to have reached Melville Bay earlier than the latter half of July We now have good reason for the hope that the two ships passed through Melville Bay and reached the "North Water" without serious obstruction, especially as the *Valorous* found the wind blowing from the north-east (and thus opening the Melville Bay passage) on July 22nd, at her furthest northern point off Hare Island, in latitude 70° 35′ N

Yet, in facing the dangers of Melville Bay, officers and men are fully prepared for the worst, and all the usual precautions have been taken In the event of a destructive nip, provisions have been placed in readiness on the upper deck, and haversacks with a change of clothes were served out to every officer and man. The plans for the shape of a dock cut in the ice, and of the pieces to be sawn, have also been drawn to scale, and officers and men appointed to provide stores, to work at the different ice-saws, and to prepare and ignite blasting-charges—each with his special duty

After reaching the "North Water," the next step will be to deposit a record, and establish a large depôt on the north-westernmost of the Cary Islands. I landed at this point in August 1851, from the *Assistance*, when a record was deposited, and I doubt whether it has been visited since. There was a large "loomery" in one of the cliffs, and a good growth of scurvy-grass (*Cochlearia Greenlandica*), making excellent salad, in the valleys Two large depôts of 3600 rations each—being one month's provisions for 120 men—have been prepared, called A and B, which are stowed on the upper decks of the *Alert* and *Discovery* respectively, ready for landing. Depôt A consists of 28 casks and 101 cases, and one of the boats supplied by the *Valorous* will also be landed, together with a record and letters, which will, I trust, be found there by the *Pandora.*

The expedition will proceed from the Cary Islands to the entrance of Smith Sound, when a navigable season, comprising the whole of August and part of September, will be before it A record will be left at Sutherland Island and, if the entrance is fairly clear of ice, also at Littelton Island Sutherland Island is the position most easily reached by a vessel coming from the south, and Littleton Island from the north, as there is sure to be always much water in the narrow part of the channel The ships will then cross to the west coast of Smith Sound, and work their way to the north on that side. If there is much ice north of the Cary Islands, the principal cairn, with records, will be on Gale Point, south of Cape Isabella The latest news will probably be found here, for if, as is likely, the *Discovery* winters on the west side of the channel, it will be easier for her to communicate with Gale Point or Cape Isabella, owing to the difficulty in crossing Smith Sound A depôt and boat will then be placed on Cape Sabine, or on one of the islands east of it.

It is hoped that suitable winter-quarters will be found for the *Discovery* on the north shore of Lady Franklin Strait, in latitude 82° N, or a short distance further north As soon as she is snugly established, a depôt of 10,000 rations will be formed on shore, together with a supply of coals Hunting-parties will then at once be thrown out, both to the shore and on the ice, to collect food for the dogs

The *Alert*, taking two officers and some men from the *Discovery*, will then press onwards alone to the north, landing depôts, and building cairns, with records, at intervals of about 60 miles These depôts, will consist of 480 rations each, or 40 days' provisions for 12 men. The Arctic ships are heavy, and seriously undermanned The surest way of reaching the Pole is not to risk failure by pushing forward away from the land If the *Alert* can winter even in 84°, and there is land ahead, there is the certainty of attaining a very high northern latitude by sledge-travelling, and of exploring the neighbouring coasts, so as to be prepared to advance the ship along known shores during the following season A second season is preferable to pushing off away from the land, and thereby risking a winter in the drifting-pack, whence all chance of exploring is at an end Consequently, if the land north of Cape Union trends westward, with a navigable sea but no land in sight to the northward, it will be best to remain by the shore for the first winter. Then, with increased knowledge of the trend of the land, the direction of the prevailing wind and the currents, and having ensured certain communication with the *Discovery*, the *Alert* can push boldly northwards in the summer of 1876 If, however, there is continuous land to the north, the *Alert* will be taken this summer to as high a northern latitude as is possible.

All the members of the expedition are fully prepared to face the winter months in the good old spirit, with plenty of scientific work for the officers, amusements of all kinds, exercise, and instruction for officers and men Constant and most careful attention is also being given to all the details of sledge-travelling, especially to the calculations with respect to depôts and weights, which all have to be thought out afresh in the light of practical facts At present the constant weights for the 8 men-sledges, which will do most work, are 540 lbs, or 77 lbs. per man; and besides this, 40 day' provisions can be carried, or 320 rations, weighing 810 lbs, making in all 177 lbs for each man to drag on the first day

The arrangements for sledge travelling are the results of long experience, and of closely tested and well-tried previous work.

The spring travelling of 1876 will probably commence about the 1st of April, and the main attempt will be made by six sledges and fifty-two men, a necessity which will only leave ten in the ship, including officers. The grand achievement will be done by a system of depôts and auxiliary sledges, enabling the foremost to be absent 112 days and to advance upwards of 509 miles from the ship.

As the earlier sledges return they will be able to do much exploring and collecting work, as well as hunting, at shorter distances from the ship, and we may hope that musk-oxen, reindeer, and birds will be abundant The dogs will chiefly be used in keeping open communications with the *Discovery;* and the two officers belonging to that ship, on board the *Alert*, will return in the spring, to be met half-way by parties from the *Discovery*, who will advance as far as 84° N., and remain until May 15th at least, waiting for their comrades from the advanced ship

The spring sledge-travelling of the *Discovery* will also be important, and forms an indispensable portion of the scheme Her parties will continue the exploration of the north coast of Greenland, and a depôt will be formed beyond Cape Stanton A party will go to Hall's grave and examine the stores there Another, with dogs, will communicate with the entrance of Smith Sound, and leave despatches and letters It is fully expected that some ship will go to the entrance of Smith Sound to communicate and receive news in the summer of 1876, and a boat will probably be sent down by the *Discovery* during the autumn

The probability of passing a second winter in the ice, and of not being able to complete the work until 1877, has been considered. If no news is obtained of the *Alert* by the *Discovery* in 1876, a most improbable contingency, the *Discovery* is to make a second attempt to communicate in 1877. But if there is still no news, the *Discovery* is to land all provisions that can be spared, and to go home in August 1877. For it may then be concluded that the *Alert* has advanced nearer to Cape Bismarck than to Robeson Channel, and may be expected to come out on the east coast of Greenland

The relief ship, which is to go out in 1877, must, if the *Alert* has not been heard of, winter at the entrance of Smith Sound If the *Discovery* cannot get out before August 1877, she is to endeavour to communicate, by boat or otherwise, with the relief ship, and the officers and crew are to abandon the *Discovery* early in 1878, leaving her in a safe position, and as habitable as possible.

These are the ways in which it is proposed to provide for all possible contingencies. But if all goes well, or even with ordinary luck, the expedition will complete its difficult and perilous, but glorious, mission without accidents, and return home in the autumn either of 1876 or 1877

The influence of yourself and the Council may, in the meanwhile, be exerted most beneficially for the good of the absent explorers, by recommending the despatch of a steamer to the entrance of Smith Sound in the spring of 1876, as a measure of necessary precaution, and to meet the parties coming south from the *Discovery*

When I went on board the *Valorous* at Ritenbenk, on July 17th, I was most kindly and hospitably received by Captain Loftus Jones •

Her orders were, after taking leave of the expedition, to endeavour to obtain Greenland coal from the seam in the Waigat Strait, and then to carry a series of deep-sea soundings and dredgings down Davis Strait and across the Atlantic. She was to take a few dredgings on a line from Disco to the latitude of Holsteinborg, 8 deep-sea soundings between that parallel and Cape Farewell, and 12 across the Atlantic, between the parallels of 60° and 57° N., ending at 20° E long, in the space between the line of soundings taken by Sir Leopold McClintock in the *Bulldog*, in 1860, to the north, and those on a great circle between Valentia and Newfoundland, taken by Captain Dayman in the *Cyclops*, in 1857, to the south Dredgings were also to be taken when practicable; and Mr. Gwyn Jeffreys, with Mr. Herbert Carpenter as his assistant, went out in the *Valorous* to examine and record the results of the dredgings The necessary apparatus for deep-sea sounding and dredgings was supplied But this should have been the work of a special steamer properly found in coal and provisions, and not of a vessel like the *Valorous*, on her return, with much reduced supplies, after completing a great and important duty

Sailing in company with the Arctic ships, the *Valorous* parted company on the 11th of June, and encountered the pack ice on the 28th, through which it became necessary for this paddle-wheel steamer to pass Captain Jones, by the exercise of great care, and himself conning the ship from aloft, succeeding in effecting the passage without serious injury to the paddles But she encountered risks to which a paddle-wheel steamer ought not to be exposed Reaching Godhavn on July 4th, after having filled up the Arctic ships with coals and provisions, it became necessary, as the *Valorous* had become very crank, to get in ballast Captain Jones's intention was to remain at Godhavn after the expedition sailed, and to get in the required quantity of ballast before proceeding to carry out the latter and less important part of his instructions But Captain Nares expressed a wish that the *Valorous* should accompany him as far as Ritenbenk, in order to enable him to finish his letters, a request to which Captain Loftus Jones readily, of course, acceded

After receiving the mail bags, the *Valorous* proceeded to the Ritenbenk Kulbrud, on the Disco shore of the Waigat, and anchored off that exposed coast, in the front of the coal cliffs, at 1 P M of July 17th The cliffs are of shale and sandstone, with four horizontal seams of coal clearly visible from the ship. They extend for about 2 miles, with ferruginous clay containing many impressions of fossil plants of the upper cretaceous period at the south end, and a dyke of white basalt breaking through the strata in one place High above the cliffs there is a ridge of basaltic buttresses 3000 feet above the sea, formed by waterfalls pouring over their summits, and a steep green slope of spongy grass and mosses intervenes between the foot of the basalt precipice and the top of the coal cliff Where the cliffs end, on either side, there are extensive deltas formed by the drainage from the interior glacier, with spits off them Indeed, the whole shore is formed of alternating stretches of cliff and intervening swampy deltas, and the outline is very different from that shown on the Admiralty chart The coal cliff is also incorrectly placed on the chart, the correct latitude being 70° 3′ 4″ N

The strait between the island of Disco and the Noursoak Peninsula, on the mainland of Greenland, is 80 miles long from Arve Prins Island to Hare Island, at its outlet in Baffin Bay, and 10 miles wide. At the north corner of Arve Prins Island there is a deep fjord separating it from the Noursoak Peninsula, with the great discharging glacier of Tossukatek at its upper end The glacier sends forth a constant stream of huge icebergs down the strait, which the Dutch well called "Waigat," or the blow-hole A current generally flows down the Waigat into Baffin Bay, carrying with it the whole harvest of icebergs from the Tossukatek glacier, and many from that of Jacobshavn, but the drift of the bergs is also influenced by the winds, which blow up or down the strait The south-east wind drives the icebergs over to the Greenland shore, while those from the north-west bring them across to the Disco side Dark mountains rise up on either land Those of Disco average a height of 3000 feet, while, on the Greenland side, the Noursoak mountains are loftier, with mighty precipices, and serrated ridges and peaks

It would be difficult to conceive a more precarious anchorage than that off the open coast of this iceberg-laden Waigat The best position that presented itself had been selected in front of the coal cliffs, and about half-way down the strait The Spits, formed off the deltas on either side, afforded some slight protection to the *Valorous*, as the icebergs ground on them, and remained aground until the heat and sea reduced their bulk and set them afloat again. Several bergs of enormous size were thus grounded, and in threatening proximity to the ship. When the *Valorous* arrived, the mass of icebergs was on the Greenland side, the wind being from the south-east, but it was evident that a wind might spring up from the opposite direction at any moment, when the ice would come over, and the ship would be in a perilous position, particularly if the weather was foggy

On Sunday, July 18th, Captain Jones sent the Navigating-Lieutenant, Mr Brood, across the Waigat in the life-boat cutter, an invention of Admiral Hall, to ascertain whether there was tolerable anchorage at Atanekerdluk, and I accompanied him This is the locality so famous for the fossil miocene plants collected by various visitors, and described by Professor Heer It took five hours to beat across the strait against a dead foul wind, amidst hundreds of icebergs and drifting berg pieces

Atanekerdluk Harbour is formed by a mass of coarse-grained dolerite about a mile long, which is connected with the mainland of the Noursoak Peninsula by an isthmus of sand, forming a bay on either side, the northern bay being further protected by a basalt rock joined to the main by another spit of sand The water in the north bay is very deep, and the entrance was blocked up with icebergs The south bay, facing the stream of bergs, was entirely filled with ice. The mountains above Atanekerdluk rise abruptly to a height of 4000 feet, ending in sharp peaks, and the strata, containing fossil plants, consist of ferruginous clay 1200 feet above the sea The deep gorges lower down show the geological section described by Dr. Brown and Professor Nordenskiold, shales with the sand-beds and coal-seams, belonging to the upper cretaceous period The whole is crossed by vast dykes of eruptive rock, which are weathered out into distinct walls on either side of the ravines, about 10 feet broad Above, where the fossil plants are found, the formation is of the miocene period

Towards evening it came on to blow hard with rain, and threatening clouds were banking up across the Disco Mountains The scene was indescribably grand and wild An army of icebergs was careering down the Waigat, and occasionally calving or turning over with a loud echoing noise. Some of them were of great height, with their summits and pinnacles, 200 feet high, peering up through the wild scud and mist Now and then a gleam of sunlight brought out a peak of the Disco Range in bright relief A close-reefed foresail was hoisted, and the boat scudded before the squalls, breasting and dashing through the waves, while the white spray curled round her and flew from her bows The spray also dashed wildly over the icebergs which were drifting down the Waigat, rising and falling on the waves, and occasionally coming into collision with a loud roar It was no easy work to steer clear of them in such a sea, so thickly were they crowded together. It was a wild and dangerous passage, and the boat did not reach the *Valorous* until near midnight In calm weather the scenery of the Waigat is very lovely Icebergs rest quietly on the glassy surface of the sea, and the sharp serrated outline of the Noursoak Range stands out in clear relief against a bright golden sky, while the grand precipices of Disco have a ruddy reflection on them from the midnight sun. Certainly, too, there is no better place for studying the formation and movements of icebergs, which can be seen drifting in hundreds out of the glacier-discharging fjord, and floating in imposing masses down the strait, grounding and again afloat, calving with loud discharges, and breaking up with a noise like thunder.

But calm or storm, neither Atanekerdluk, nor any part of the Waigat, are fit places for a paddle-wheel steamer, and the *Valorous* coaled there at great and constant risk The lowest seam of coal close to the beach, at the Ritenbenk Kulbrud, appeared to be the best, and here the working parties commenced operations It is a light coal, containing bitumen, and it was found that 1 lb of it boiled a gallon of water in 25 minutes, which English coal did in 18 minutes During five days the men worked admirably, and in 88 working hours they got on board 105 tons of coal. But the ship had been in constant danger from the drifting icebergs; and on Wednesday, the 21st of July, a larger mass of ice than usual drifted down, and made it necessary to get under weigh. We were not an hour too soon, for the wind shifted round to the north, with fog, which would have brought all the ice over to the Disco side, and the ship would have stood a good chance of being driven on shore In the evening of July 21st the *Valorous* steamed down the Waigat, and was off Hare Island, at the north end of Disco, next morning

The second and supplementary part of the work imposed upon the *Valorous* now commenced, namely, the dredging and sounding between Disco and the latitude of Holsteinborg. Two dredgings were taken in the Waigat, and two off Hare Island, on the 22nd, two on the 23rd, two on the 24th, off Rifkol, and another off the 26th; all with valuable and interesting results But it was also necessary to complete the work of getting in the ballast, which had been broken off at Godhavn, and Captain Jones decided upon putting into Holsteinborg for that purpose Godhavn was now considerably out of the way, while Holsteinborg is clear of the east ice, drifting from the south; and at the same time conveniently situated for commencing the deep-sea soundings in the parallel of 67° N

On Sunday, July 25th, the ship was near the Knight Islands, a long reef of dangerous rocks just to the north of Holsteinborg, but the weather was foggy, and Captain Jones stood out to sea, waiting for the mists to clear away The 26th was also foggy, and the *Valorous* continued to stand off the land The fog cleared away in the morning of Tuesday, the 27th of July, and Captain Jones shaped a course to Holsteinborg, the current setting the ship rapidly to the north, until, at 7 A M, she sighted the outermost of the Knight Islands According to the general chart, the harbour of Holsteinborg is approached by an east course, to the south of these islands There is also a special plan of the harbour, which was surveyed in 1854 by the officers of the *Phœnix*, but it only shows the inner anchorage, and affords no information respecting the approaches Captain Jones, after getting well clear of, and 3 miles to the south of the Knight Islands—the only danger indicated on the chart,—found himself 10 miles outside Holsteinborg, and, so far as the chart or sailing directions informed him, in the fair way for the harbour Feeling his way carefully in, he shortened sail, and shaping a course nearly east, he proceeded, under steam, at a rate of 4 knots At a distance of 5 miles ahead there was a round island, which was taken for one shown on the chart, with a beacon on it. It had also been so taken by the *Alert*, when she passed this part of the coast on July 4th Although he was several miles from the port, Captain Jones was on the point of stopping the engines, and sending a boat in for a pilot, when the ship struck on a sunken rock at 9 15 A M At the time there were two leadsmen on each paddle-box, with leads constantly going, and a minute before the port leadsman had got 17 fathoms Providentially the tide was rising, but for the next two hours the ship bumped heavily against the rocks Boats were got out, and all precautions that forethought could suggest were taken

The cutter was sent away, in charge of Lieutenant Wood, to ascertain the position of the harbour, get a pilot, and give notice of the accident, and at 4 P M. the boat returned with Mr. Lassen, the Governor of Holsteinborg, and several natives Fortunately, the wind had died away in the afternoon. The *Valorous* was piloted round to the south of the reefs, and safely, anchored off the settlement of Holsteinborg at 7 P M Mr Lassen said that, owing to reefs and sunken rocks not indicated on the chart, Holsteinborg could only be approached from the south It so happens that ships always have come from the south—the *Victory*, with Sir John Ross in 1829; the *Phœnix* and *Breadalbane* in 1853, the *Fox* in 1858, the *Juanita* in 1873, and the annual ships from Denmark. But it appears that, between 1850 and 1860, a Scotch fishing schooner, approaching from the west, was lost on this very reef. On the 28th and 29th Captain Jones and the Navigating Lieutenant were occupied in making a survey of the approaches to the harbour. It was found that the Knight Islands, instead of running out from the coast in an east and west line, as shown on the general chart, trend at a sharp angle to the south-west, that other islands were out of their places, and that several islands and rocks are not shown It is a dangerous and practically unsurveyed coast, and Captain Jones, in approaching it, used every precaution, and exercised that seamanlike care which he has shown throughout the performance of the difficult and hazardous service that has been entrusted to him.

The ship struck full on the stem, causing a leak forward; and the injuries were found to be mainly in the main keel and garboard strakes, which were started. The pumps were kept constantly going, the divers were set to work, and the best available means of repairing the damage for the voyage across the Atlantic were adopted. The ship's company, consisting of a large proportion of young men and boys, worked well and cheerfully. If ever men earned special reward for exceptional service, the ship's company of the *Valorous* certainly have done so, and well deserve some recognition

The *Valorous*—in spite of her disadvantages as a paddle-wheel steamer, the risks she ran in the Waigat, and the unfortunate accident off Holsteinborg, which no foresight could have prevented—has done some useful work in addition to the great services performed for the Arctic Expedition. The latitudes of the Ritenbenk coal-mine and of the Atanekerdluk have been corrected, the Holsteinborg survey has been revised and improved, and the dangers pointed out; and much valuable dredging has been done at Godhavn, in the Waigat, in Baffin Bay, between the parallels of 70° and 67° N., at Holsteinborg, in Davis Strait, and the Atlantic. The repairs were completed in 12 days; and on the 8th of August the *Valorous* sailed from Holsteinborg, recrossing the Arctic Circle at midnight. Although it was necessary that the *Valorous*, in her injured condition, should make the best of her way home, Captain Jones resolved at the same time to carry out his instructions as closely as the altered circumstances would permit.

The accompanying diagram shows the position and character of the important series of soundings and dredgings that was taken by the *Valorous* down the centre of Davis Strait, and across the Atlantic, in the previously unexamined area between the lines of the *Bulldog* and the *Cyclops* Four were taken in Davis Strait on the 10th, 11th, 12th, and 14th of August, about 60 miles apart, in 410, 1100, 1350, and 1750 fathoms, and the contents of the dredge which was sent down on the 10th, 11th, and 14th, were pronounced by Mr. Gwyn Jeffreys to be interesting and important, especially as regards the new information they furnish respecting the geographical distribution of the Norwegian and Greenland marine fauna.

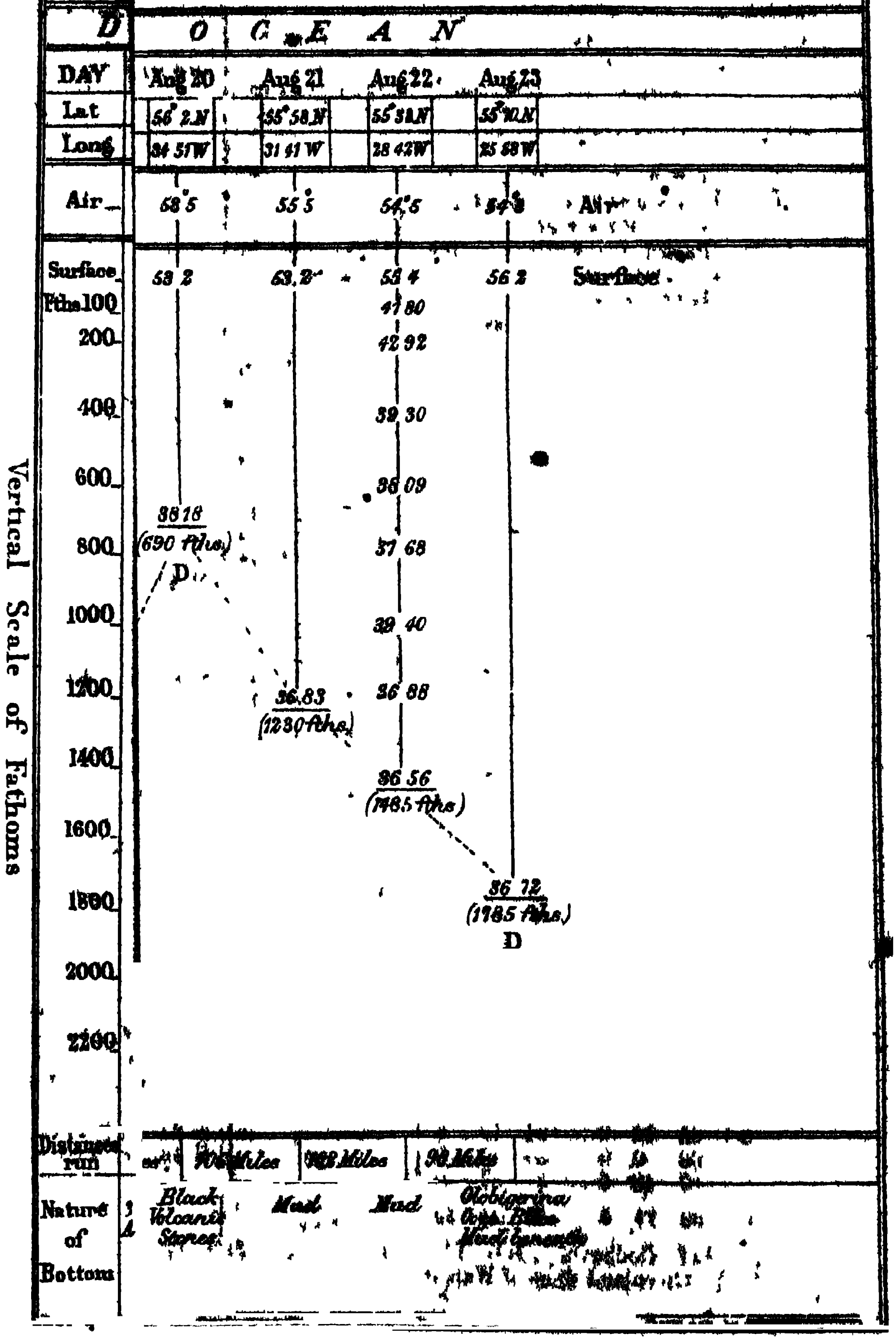
The Atlantic soundings, seven in number, extend along a great circle: three being taken with serial temperatures, and the rest with surface and bottom temperatures only The dredge was sent down three times, in 1450, 690, and 1785 fathoms, with results as important as those obtained in Davis Straits. The most interesting discovery made through the soundings is that in latitude 56° N., and longitude 34° 50′ W., in a line 400 miles south-east from Cape Farewell. There are only 690 fathoms, with a comparatively rapid slope on either side The dredge, on the summit of this "cap," as well as on the slope in 1450 fathoms the day before, brought up bits of basalt and other black volcanic stones; and it is remarkable that they were, for the most part, angular, and not rounded as they would have been if they had been brought from any distance by currents. A gale of wind came on on the 24th, which put an end to further soundings, otherwise three more would have been taken.

I also enclose a table giving the latitudes and longitudes of the *Alert* and *Discovery* on the passage from Portsmouth to the Waigat.

TRACK of the ARCTIC EXPEDITION from PORTSMOUTH to the WAIGAT.

Date	'ALERT'		'DISCOVERY'		Current ('ALERT')
	Latitude N	Longitude W	Latitude N	Longitude. W	
1875.					
May 29	Sailed from Portsmouth, round St Catherine's Point		'Discovery' in company.		
,, 30	8 A.M. off the Start ..				
,, 31	Passed the Scillies in the middle watch ..				
June 1	Bantry Bay . ..				
,, 2	At noon left Bantry Bay ..				
,, 3					
,, 4	52° 26′ 0″	11° 57′ 0″	52° 28′	11° 49′	
,, 5	53 12 0	14 9 0	53 16	..	
,, 6	53 31 0	14 57 0	53 47	15 4	N. 9° E, 20 miles
,, 7	54 35 0	16 52 0	54 33	16 58	N. 19° W, 11 miles
,, 8	56 5 0	17 21 0	56 6	17 22	
,, 9	56 35 0	19 21 0	56 21	19 30	
,, 10	54 58 0	20 54 0	54 33	20 45	
,, 11	53 27 0	21 49 0	53 18	21 49	
,, 12	52 33 0	22 36 0	52 28	22 48	
,, 13	53 41 0	23 10 0	..	..	N 42° E, 20 miles in two days
,, 14	53 57 0	23 34 0	53 59	22 53	
,, 15	52 36 0	25 32 0	53 12	23 20	
,, 16	52 42 0	27 36 0	52 23	25 41	S 44° E, 5 miles
,, 17	54 14 0	30 32 0	53 42	28 12	
,, 18	57 26 0	31 4 0	54 56	29 49	N. 61° E, 49 miles in two days
,, 19	57 2 0	31 48 0	55 7	30 56	N 76° E, 8 miles
,, 20	57 34 0	31 18 0	54 24	30 33	S. 82° E, 7 miles
,, 21	58 3 0	33 40 0	55 47	32 52	
,, 22	59 23 0	35 46 0	58 31	33 45	N. 12° E, 20 miles in two days.
,, 23	59 36 0	39 5 0	59 0	37 4	N 2° W., 17 miles
,, 24	58 0 0	40 22 0	57 16	39 17	
,, 25	58 5 0	41 43 0	57 52	37 34	
,, 26	58 39 0	46 4 0	57 59	42 20	
,, 27	59 36 0	48 46 0	58 29	46 23	
,, 28	60 20 0	49 31 0	59 59	47 51	N 17° E, 16 miles.
,, 29	61 52 0	51 20 0	61 0	50 43	N 31° W., 16 miles
,, 30	61 48 0	52 4 0	61 31	51 3	S 34° W, 22 miles
July 1	63 16 0	52 39 0	63 24	53 47	N 2° W, 11 miles
,, 2	64 44 0	52 53 0	'Discovery' in company .		N 45° E., 8 miles
,, 3	65 26 0	54 12 0			S 25° E, 8 miles
,, 4	66 0 0	53 59 0			S. 16° W., 9 miles
,, 5	67 43 0	54 37 0			
,, 6	69 14 4	52 24 40	At anchor in Godhavn.		
,, 15	Left Godhavn. July 16, at Ritenbenk. July 17, sailed down Greenland shore of Waigat				

AND THE ATLANTIC OCEAN.



2. *Journey beyond the Cataracts of the Upper Nile towards the Albert Nyanza.* By Lieut. W. H. Chippindall, R. E.

Our party left Dufflé, a Government station in latitude 3° 30′, about 7 miles above the cataracts of the White Nile, on the 26th of February, 1875 The route chosen was that by Faloro, as it was considered advisable to secure the services of a chief there, named Abul Hussein, who was always in communication with Wadlay, the chief of the Koshi, and was reported to be a great friend of the latter.

The first station on the route was Gaifi, or, as the natives call it, Fagrinia, at a distance of 3 hours' march across a flat, grass-land country, whose surface soil consists of a black, vegetable mould, which, when moistened by the rain, swells and forms a sticky mud in which the donkeys (the only beasts of burden) slide and slip in the most uncomfortable manner A low range of volcanic hills, called Jebel Fagrinia, was left on our right, at a distance of about 1½ mile The seriba, or palisaded village of Gaifi, is a tolerably large one, and very densely inhabited. A little to the north-east is the old Dongolaui Seriba, now transformed into a Government station, with a garrison of 1 corporal and 10 men In this Madi country nearly all the chiefs desire to have Government soldiers near them to protect them from their enemies.

Leaving Gaifi next day, we started for Faloro, which was reached after a two-days' march; here we rested a day to complete the arrangements with the chief who was to accompany us for the rest of the route

The seriba of Faloro is situated on the spur of one of the hills which begin to rise there, and is about 900 feet higher than Dufflé

On the 2nd of March Faloro was left, and the party, guided by the chief, started in a south-west direction Crossing in a 3 hours' march the hills and picturesque glens of Faloro, the party then entered on a vast plain, extending to the south and west as far as the eye could reach, whilst the hills retreated along the left. After a 4 hours' march across this plain in a s s w. direction, during which numerous watercourses or Chors were crossed, a native seriba, named Yoyie, was reached, but the people, taking us for Dongolaui, ran, and some time was lost convincing them of their mistake The chief of the seriba, however, could not be persuaded to come and see us, excusing himself on the plea that the Dongolaui had so pillaged him that he had nothing left which he could bring as a present, and was therefore ashamed to come.

It was evidently no good to remain there, so we pushed on for another half-hour to the seriba Erranga, where the people were not so timid; we quickly established confidence, and the inhabitants, male and female, were soon thronging our camp, curious to see a *white* man In this part of the country the natives had already commenced to prepare the ground for their durrah crop.

Leaving early next morning, we proceeded through a country of high grass and low scrub-trees The grass reached high above the head, and thus prevented any observation of the neighbouring features of the ground As usual, there were very many watercourses to cross, all pretty well filled with water, owing to the heavy thunder-storms, which were already coming up from the south-east After a 7 hours' march our party arrived at the seriba Obufie, where we halted for the night. The natives received us at first with a certain amount of distrust, but this soon vanished, and we were quickly good friends.

The following day, a short 4 hours' march across innumerable ravines, and finally along the brow of a hill in a s.s w. direction, brought us to the Nile, opposite the Koshi village of Fashora, in latitude 2° 30′ by dead reckoning, but this is got by assuming along the whole route the same magnetic variation as at Dufflé, and therefore probably this latitude is erroneous, as the variation of the compass at Dufflé is only 6¾°. Unluckily, no observations could be taken, although we were provided with all the necessaries.

The question now arose how to cross the river, for although we had a chief with us who was friendly with the Koshi, yet they, taking us to be Dongolaui, imagined we had brought the chief with us by force. They therefore drew up their canoes on the other side, and refused to ferry us across!

Remembering what Livingstone had done in a similar case, we searched for ambatch to make a raft, but none was to be found, and the day was slipping away. We had no food, and the chiefs and porters began to talk of returning; that, however, was out of the question. At last a happy thought struck one of the party, viz., to build huts so as to excite the curiosity of the Koshi, then, early on the next morning, hide ten men in the underwood, and march the rest of the caravan off as if returning home. The Koshi would then venture over to pick up anything left behind in the numerous huts, and their boats would be seized by the ten men in ambush. This plan was carried out, and by 9 A M the next morning we possessed two canoes and one prisoner, the rest of the crews having escaped into the woods We passed over safely, the Koshi not offering to resist us when once we had the canoes and the prisoner, who, it afterwards turned out, was a chief, and whom we retained as a hostage until the passage was completed

The river here winds about very much, away to the south it forms a good-sized lake, but so shallow, they say that it might be termed an inundation, and when the river is very low, this lake is dry for the greater part All the banks are lined by the usual gigantic tropical aquatic vegetation, in which these natives construct huge fish baulks. They pile out from the reeds into the current, and then wattle in between the piles, thus diverting some of the current and making it flow into the reeds at the side. These reeds they cut away and form a wedge-shaped gap, at the end of which they fix a fish-basket, thus large numbers of fish coming down stream are carried in and hopelessly trapped

The large majority of the natives were naked; a few wore skins of goats slung round their loins. They nearly all wear a ring through the centre of the upper lip; and, as regards colour, they are very various, some being black, whilst there are others of all shades between that and coffee-colour These latter come from near the lake, and are called Magango.

The chief of the Koshi (Wadlay) came to see us at the village of Fashora, where we had crossed the river, as we did not wish to penetrate inland, for the country was afflicted with that most terrible of scourges, small-pox, and had the soldiers and parties caught the infection, we should all have been at the mercy of these people, who, being of a cowardly nature, would probably have behaved treacherously when they found us helpless.

Wadlay informed us that his territory extended as far as the shores of the lake, and that in three days' easy marching one could be there. He also told us that the river higher up split into two branches, which he seemed to consider as two distinct rivers; the one, he said, came from Magungo, and belonged to Kaba Régа, the other came from the great lake, and by it you could always enter the lake. Now this tale about two rivers or branches we had heard from the Dongolaui soldiers, who had been over to the Koshi to raid, and they all declared that when they were on the hills to the west of the Koshi—where the Lour tribe live—they had distinctly seen two rivers, or it might be two branches of the same river. Probably there is a very large island at the entrance to the lake, which would account for these two rivers both flowing from the same lake

This chief (Wadlay) seemed well pleased to give us what information he could, and was not at all suspicious at our asking such numbers of questions regarding his country. He soon left us (there having been an interchange of presents), as his son and wife had that morning died of small-pox, and he wished to be present at the funeral.

In the evening he sent us some native cloth, made from the bark of a tree, and very like that made by the Waganda, only of a coarser fibre. He himself had worn a robe of this cloth during our interview, but his brother only carried a goat-skin; thus it would seem that the cloth is not very common, and is therefore reserved as a speciality for great personages.

Having now made friends with Wadlay, and secured his promise of future co-operation, we determined to return without visiting the lake, as we were very anxious regarding our men and the small-pox The river was therefore recrossed the following day; it is about 450 yards wide, and runs at about two knots an hour. The march back was by the same route as before, and Dufflé was reached without any accident.

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3. *A Trip round the South End of Zanzibar Island.*

By Alfred Bellville, F.R.G S

On the 23rd of June, 1875, a party, of which the writer was a member, left the Universities' Mission Station at Kiungani, to explore the southern and, if the time before the arrival of the English mail allowed, the northern part of the Island of Zanzibar. They had as interpreters the two men, Chumah and Susi, whose names are famous as the faithful and devoted servants of Dr Livingstone, and two other natives who acted as porters. These men carried bags, which contained bedding and spare clothes and cooking-utensils. The party started early in the forenoon, following the general footpath, which runs to the southward, keeping parallel to the coast as far as Mbweni, where the Universities' Mission have another station Here the coast trends to the westward and forms a headland, while the road runs to the south, turning a little to the east, and towards the centre of that part of the island. The land here is elevated about 50 feet above the sea, near the coast, gently undulating, and divided from the central ridge by a long marshy valley, broken into numerous ponds running south, and in which many ducks and other water-fowl are found. The soil here is in general black, mixed with red loam resting upon a stratum of sand, in which are many pebbles of quartz, the sand in its turn resting upon blue clay. The whole country here is divided into shambas or plantations, and highly cultivated; while the huts of the negro cultivators, and more pretentious houses of the proprietors, are continually seen The party, after walking about 3 miles, halted at a shamba to enjoy their noonday meal. The wide footpath, with hedge-rows on either side, which extends about 2 miles from Kiungani, had merged into many smaller ones. The march was continued in a south-eastern direction, passing from one shamba to another under the guidance of the natives. The soil was red loam, and its productions were—mtama (*Holcus sorghum*, or Dura), mahindi (Indian corn), mhogo (sweet cassava), mbalzi (a species of pea growing on a tall bush), coconut palms, bananas, mangoes, oranges, lemons, custard apples, and a variety of others of less consequence. After marching till sunset, they halted, and slept near an empty house.

The next morning they started early, and proceeded south towards a remarkable hill called "Hautajwa," which constitutes one of the landmarks for entering the harbour of Zanzibar from the south. It appears to be a block of coralline, forced up through the surrounding country to a height above the sea, by aneroid, of about 170 feet; perpendicular on all sides but one—the western—and densely covered with bush and some trees. This promontory of the island extends a few miles further south, but is very stony, and considerably less fertile. After descending the hill the party turned east, and descended some 30 feet into a low stony flat, on which walking was very tedious, it was covered with coarse grass and bushes. They then made a south-east course for about 2 miles till they came to the shore of Menai Inlet, which here runs up a considerable distance into the island. The south end of Zanzibar is divided into three promontories by Peete and Menai inlets, which run up into the island about an equal distance. Here, at a fishing-village, they tried to get a canoe to cross the inlet to the other side, but without success; so they went south along the shore, passing many villages and large fields of mtama, and then along the beach itself for about 2 miles, to a village near the point called Bayala, where large canoes were kept On arriving here, it was found that the *Royal Victoria* sailing-launch of H M S. *London* had just anchored Hearing a shot fired at a bird, the officer in charge came on shore, and, being personally known to the party, volunteered to take them across during the day, which offer was gladly accepted Small herons, curlews, and sandpipers were very plentiful here They then went on board, and about noon the *Royal Victoria* weighed and stood across the inlet, but not finding sufficient water in the middle, on account of a reef extending down the middle of the inlet, from an island at the head beat to windward of a small rocky islet that lay on the reef, crossing the inlet in 2¼ fathoms in the shoalest part, and anchoring in 1 fathom water just to the south of the rocky point of a small inlet, and a few miles north of Ungudya Mkun, or old Zanzibar Here the coast was rocky and covered with jungle, though stone walls showed that it had been cultivated once, and it was not till after they had been wandering about some time, that Susi struck on a footpath which led in a south-easterly direction to a large village standing amid its fields of mtama and sweet potatoes. Here the party desired to stop, as it was now dusk, but the head man sent them on in a southerly direction, through a well-cultivated country, to an old Balooch, who was the great man of the place, and who received the party with great show of hospitality

In the morning the party were delayed some time till the tide had fallen sufficiently to allow them to cross a small inlet that separated them from the island, on which is situated the town of Uzi. On starting, the old Balooch gave them two men gratuitously to assist as guides and porters during the remainder of the journey, after which they were to return to him again About 10 A.M. they again started, going in a southerly direction, along a flat, well-cultivated country, crossing a gentle rise, they found themselves on the beach of the inlet, very near the point which formed its western side. Here birds were very plentiful, and several were shot. The party then crossed the inlet in a diagonal direction on foot The water was about knee-deep, though nearly waist-deep in the channel in the middle; the bottom was coral-rock, and very sharp to the unprotected feet. A worn track, like a footpath, could be seen stretching all the way across. The inlet is a good half-mile broad, and ends in a mangrove-marsh. On reaching the opposite side, the party crossed another mangrove-swamp or muddy flat, and then got on high ground, proceeding south-east till they reached the town of Uzi, which is the largest in the island, putting aside the city of Zanzibar itself, and contains over 200 good-sized, well-built huts of wattle-and-daub, with stockades No stone houses, except the mosque, were seen, and provisions, such as fowls, rice, eggs, grains, and fruit, were plentiful, and tolerably cheap. The town was surrounded by large trees, and coconut palms, mangoes, and bananas also appeared in abundance. The huts were not crowded together, and the intervening spaces were kept clean, altogether it was a very good specimen of a large native town. The soil here, after passing the mangroves, was a rich red loam.

After leaving Uzi the party proceeded in a south-easterly direction, passing through large fields of grain, which were interspersed with large baobabs and other trees, then passing through some thick undergrowth, they descended a steep bank, and found themselves on the shore of Peete Inlet, in a little sandy nook, where there were some canoes. Here, after considerable bargaining, Chumah arranged that the whole party should cross the inlet in two batches for 50 pice, or rather less than a rupee, the distance being nearly two miles The western bank was shelving, and poles were used for some distance, then the water became very deep, and the canoes were paddled right across to the eastern side, which was steep-to and rocky. When all the party were across, they proceeded on, still keeping in a south-easterly direction by a native footpath, toward a rising ground, seen in the distance from the shores of the inlet. The path was over coral rock, covered with bushes and small trees, which grew upon the scanty supply of soil which lodged in the interstices of the rock. As the sun had now set, and it was nearly dark, the roughness of the path was very severe on the unprotected feet of the bearers. After walking nearly 3 miles, the rock suddenly ceased, and the party found themselves on the border of an open flat covered with long grass, though cleared and cultivated with sugar-cane, in some places with many coconut-palms, which were not found upon the rocky tract. Crossing the flat, the party ascended a ridge of clay, and arrived at a village, where they purposed stopping, but were again bidden to go further on, to the great man's house Visions of drunken Arabs arose before them, and they protested, but to no purpose; so they descended into a valley, and ascended another hill planted with sugar, and arrived at the sugar-mill of a young Arab named Syde bin Seff, who was sober, and received them most hospitably. Crushed rice and syrup of sugar, and oranges, were offered as a sweetmeat, then dinner prepared The place was called Moyoni, and is a country estate, where the Arabs retire from Zanzibar to make sugar and honey The mill was a most primitive affair, and yet showed considerable ingenuity. It consisted of a deep pit, in which two wooden screws worked one in the other One had the shaft prolonged, and a square head on it, in which were holes, into which long bars were shipped, like a capstan. These bars were worked by donkeys, whose stable was close to the mill The thread of the screws was about 3 inches square, and cut by hand upon the shafts A sort of treacle is the principal manufacture, which is sold all over the island as honey of sugar. The elevation of the hill here was about 100 feet above sea-level The party started early the next morning, after a few showers, intending to make their way right across the island, as Ras Kizimikas had been visited by the cruisers' boats, and was well known Syde bin Seff reported a good road and plenty of villages, so on the strength of his assertion they set out. In the first mile the hill rose to about 250 feet above sea-level, and then descended to about 50 feet elevation. The soil was good red loam, on black and yellow clay Sugar, grain, and coconuts abundant They then crossed another flat, and arrived on the outer edge of another belt of coralline, which was reported to extend to the sea on the east coast. Thus this part of the island consisted of coral rock, with a high ridge of yellow and black clay extending along the interior about 2 miles from the west coast north and south. It seemed more like a line of separate hills than one long ridge. The party proceeded on in an E.N.E. direction through this stony belt, the path winding about in all directions, crossing alternate ridges of rock and grass flats where there was any alluvial soil. After awhile the grassy flats ceased, and wooded flats of small trees took their place. Large fields of mtama were growing on the naked rock, which were raised by escaped slaves from Zanzibar, who dwelt in detached huts, at places where a scanty supply of water was found. The party took shelter about noon at one of these locations from a heavy shower of rain, resuming their march when it cleared up. About 2 P.M. they halted at a village, where there were some half-dozen huts, for dinner. After again resuming their march, they passed through a more open country, where pawpaws grew wild in abundance on the rocks. Towards evening they passed a larger village, and the road became better; and they entered just before sunset a large village on the east coast, called Paji. They had walked, by pedometer, about 15 miles, over the worst road the writer ever saw, and almost the most wonderful; to see the bushes, mtama, trees, and pawpaws, growing on nothing but a little earth in the cracks and holes of the coralline. The country was crossed in all directions by wood fences and stone walls, to keep the wild pigs, here very numerous, out of the fields of mtama

Paji is situated about 500 yards from the beach, on a sandy flat, and appears to be a good-sized village The usual provisions were plentiful and cheap.

The next morning, being Sunday, the party determined to do as little marching as possible, so they started off early to walk to Bweyu, a few miles to the north, along the beach. On reaching the beach they found that Makundusha Point lay to the south-east, about 7 miles off. They arrived at Bweyu, or Boyya, as it is called in H M S. *Shearwater's* Survey, in about an hour, the beach here consisting of a fine white muddy sand, evidently being coral sand It could hardly be called mud, as it was not cohesive enough. This coral sand extended out about a mile to sea, where it was bounded by a coral reef, on which the ceaseless swell of the Indian Ocean broke with a dull heavy roar. The reef extended north and south, parallel with the coast as far as the eye could see, and inside which the native fishermen plied their craft in canoes.

Bweyu is a large village, and boasts a Banyan, who keeps a shop and a stone mosque; the huts are of wattle-and-daub The Banyan did a large trade in shells, heaps of which were scattered over the village, from which a by no means pleasant smell arose as its unfortunate inhabitant rotted out. They were sold at the rate of about 15 pecks for 2 dollars In the afternoon the party again resumed their march in a north-west direction to a village called Kongoroni. A short distance out of Bweyu, they again found themselves in the same rocky country as of the previous day. About two miles from Bweyu they came to a deep well cut in the solid rock, where there was plenty of very good water, the well was evidently very old They passed many large fields of mtama and a few scattered huts, then passed through much small, timber, where there were many monkeys, and about sunset arrived at the straggling village of Kongoroni, situated among fields of mtama, where they halted for the night

In the morning they again resumed their march, passing over a dreadfully rough and rocky country in a W.N.W. direction, which was extremely difficult to walk over, and to avoid slipping into the holes which abounded on every side, evidently worn out by the action of water. After about two miles of this they came to a long mud flat that formed the head of one of the numerous bays of Chuaka Inlet. Here they had to cross a stream, which took them up to their waists, about 400 yards wide, and then over to the other side. The rocks here were covered with small, but well-flavoured, oysters. As the tide was coming in they took a canoe here, and coasting as far as the point, crossed over the main inlet to Chuaka on the northern side. The inlet is not above 1 fathom deep at low water right across, till you get past a small rocky islet with three trees on it; between this and the northern shore, about 200 yards from the latter, an apparently deep crack occurs in the coral rock of which the bottom is composed, and the water changes colour to a dark green, denoting great depth. The canoe man, on being asked, said, "It took 2 hours to go to the bottom," which was interpreted by Susi to mean about 5 fathoms. The canoe man also said it extended right up the harbour, and also out to sea without any obstructions. It was about 100 yards broad, wide enough for a small steamer or schooner, with a fair wind, to pass up and down, or lay stem and stern. Chuaka is a good-sized village, and a considerable trade is done here in shells. Leaving Chuaka in the afternoon, they proceeded on their journey again, keeping about west by south towards the centre of the island. It was reported by the people at Chuaka that the country to the north was worse, if possible, than that over which they had come, and impassable, except to donkeys; and as the time was getting short they determined to go west as far as Dunga, in the centre of the island, and then, if they felt disposed, turn north from there. At first the road was rocky, but after a time became better, when they arrived at a village with the euphonious name of Oohoohma, which consisted of a few huts amid fields of mtama After leaving here they crossed a high ridge of rock, covered with thick bush, and then came to a long alluvial flat covered with high grass Here the road turned to the north-west, crossing this flat and several grassy undulations, on which baobabs and other large trees grew; they then passed a small village and came to a large wattle-and-daub house belonging to a negro, that stood in a plot of well-cultivated ground. Here they were hospitably received by the owner. The country rose gradually all the way from the sea, the house standing about 90 feet above it. But a range of hills were seen to the north running parallel with the general direction of the island; the end of them appeared about 3 miles off, and they were about 200 feet higher than the surrounding country, and covered with bush.

From here they proceeded on in the morning toward Dunga, passing through a well-cultivated district, where they arrived after walking about 3 miles The village of Dunga is very large, and is rather an inhabited district than a town; but the great attraction is the palace of the Munyi Ukuu, or Sovereign of the Wahademu, the original inhabitants of Zanzibar It is a large, two-storied stone house, which stands on a brow of a hill about 150 feet above sea-level, overlooking a large valley, and surrounded by a dilapidated stone wall, with square bastions at intervals, an imposing gateway at the north end, and which encloses a very large courtyard. The house is at present uninhabited, except by some negroes, and is in a most dilapidated state, the roof of one of the rooms has fallen through, carrying away the floor, while the upper story is only covered by a rude thatch—anything but weather-proof. But the large mirrors of plate-glass, stained-glass windows, marble floors, and elaborate iron balustrades, testify to its former grandeur.

From Dunga the party descended into the valley, and crossed a flat, grassy, uncultivated and marshy plain, then a more undulating and cultivated tract, and after a distance of about 2 miles as the crow flies, ascended to the top of a high hill, close to an Arab house, which attains an altitude of about 260 feet above sea-level Here cloves were seen for the first time, but only in small quantities. The Arab's house was surrounded by many fruit trees and large fields of mtama. Descending the hill on the other side, they passed through a similar country to the other side of the hill, and more or less cultivated, crossing, at a distance of about 6 miles from Dunga, the River Mware by a stone bridge of 30 yards long by 10 yards broad. This river ran through the valley to the head of Menai Inlet. After leaving the river they turned a little to the north, passing through much cultivated ground, where clove bushes were beginning to abound, and finally halted for the night at a place called Yanga, a clove farm, belonging to an Oman Arab, named Rasched bin Emir, on the slopes of the spurs of the next range of hills. This man also behaved with great hospitality. The cloves were all small bushes, and were planted on the side of the hill, about 2 yards apart, with a small bank on the lower side to catch the rain-water and retain it round the plant.

Leaving Yanga in the morning, they proceeded on for nearly a mile in a westerly direction up the hill by a broad road, near the top turning off to the north-west, by a clove-lined road, to the house of Masingini at the top This house, at an elevation of 390 feet above sea-level, is the residence of a sister of the Sultan, and occupying one of the highest spots in the island, commands a most extensive view from the sea at Chuaka, all round the south end of the island, up the west side to the north-west The view is very fine Dunga comes out in bold relief to the south-east, while Zanzibar and the ships are plainly seen to the south-west From Masingini House, the party descended in a north-west direction, by long spurs and deep water-worn uncultivated ravines to the lowest cultivated undulating flats. It was evident by the deep-cut ravines that the chief force of the rain-squalls was expended on the western side of the ridge, as well as by the numerous small streams crossed later The soil was chiefly red loam, showing in some places quantities of a red gravel underneath After descending about 250 feet, they crossed the regular cultivated country common to that part of Zanzibar, and struck the main road to Kotlotoni at the sea, just south of Booloobоо As their time was now up, they returned to the Mission House at Kiungani, by the road that led through the Malagash suburb of Zanzibar, halting for a short time to see the new and well-built houses of Chumah and Susi, situated in that suburb of Zanzibar, at no great distance from the house inhabited by Dr Livingstone when he was last in Zanzibar The party arrived at the Mission House in the evening, after an absence of 8 days.

With regard to the population of the island, all the part immediately south and north of Zanzibar is most densely populated. A hundred to the square mile could not be too much—very likely it is under the mark Uzi would have at least 2000 inhabitants, while the smaller villages, such as Bweyu, Paji, Mayoni, and a few others, 1000 each, and the smaller ones 500 One great thing noticeable was the absence of mosquitoes None of the party had any occasion to use their mosquito nets at any place on the march, while at Kiungani they are anything but absent A few bearings by prismatic compass were taken, which are shown on our map* The outline of the island and general features are from the *Shearwater's* survey, corrected where discrepancies appeared The whole island being so flat, as a rule, with no distinguishing points, it was impossible to get more than one or two bearings here and there, more as a general guide than to fix any position.

4 *Journey to the Universities' Mission Station of Magila, on the Borders of the Usambara Country.* By ALFRED BELLVILLE, F R G.S

On the 7th of July, 1875, a party, consisting of the Right Rev Bishop Steere, Rev J. P. Farler, Messrs. Beardall, Moss, and the writer, together with several of the mission boys and Chumah and Susi, and a native crew, started in the yawl *Ware*, from the Mission-house at Kiungani, for the River Mtangata, half-way between Pangani and Tonga. Besides the above party, we had in the boat about 2 tons of baggage and stores. We left about 4 P M., and after about five hours' sailing, with a fresh breeze well off the land from the eastward, anchored off Osawemba Point in 15 fathoms water, with good muddy bottom. Leaving here at daylight, with a fair wind, we arrived off Pangani about noon, and passing inside the reefs, under the skilful steering of an old master of a dhow, to the north of Maziwi Island, we arrived off the mouth of the Mtangata River about 2 30 P.M., at low water. At first a long spit of sand seemed to bar all entrance, but on sailing further to the north the wide river opened, and after an unsuccessful attempt to beat up, we finally pulled to the town of Marongo, situated on the south shore of the harbour, about half a mile from the sea. The mouth of the river, together with two islands—Yambi to the north, and Karange to the south—forms a good harbour Completely shut in to the southward by reefs and islands, the dhows can safely lie there during the south-west monsoon, and as the only opening to the north-east is by the narrow passage between the two islands, the harbour must be comparatively sheltered at all seasons Opposite the village of Marongo there is from 1 to 1½ fathom at low-water springs, and all sand and mud, with no rocks, further out the water deepens to 3 and more fathoms At Marongo a two-storied house, situated near the beach, in the joint possession of the Mission and one of the chiefs, forms a good mark for entering the harbour The village is half surrounded by a loopholed low wall, but as two chiefs and parties claim possession of it, and they are always at loggerheads—though not openly at war—the wall was never finished, the other party refusing to contribute their half or allow it to be done From Marongo we took a westerly course, the evening of the day after we arrived, and skirting the harbour, crossed the river—about half a mile wide—that comes from the south-west. On the Marongo side is the village of Pambani, on the other that of Tongoni, near which are the ruins visited by Captain Burton We also visited them on our return

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* Deposited in the Map-Room of the Society —[ED.]

On the following morning we mustered our porters—about 20—and left Tongoni, proceeding in a general westerly direction, about 7 A M., crossing a mangrove-lined salt creek at the back of the village, and then ascending a rise, in which the coral rock showed plainly, passing through many fields of mtama (*Holcus sorghum*), and then into the open, well-wooded country beyond. When once you leave the shore, you leave all signs of life We stopped at the edge of the belt of cultivation to adjust the burdens, and then marched on, halting at a hollow called Kwamkembe, about 9 A M, where there had once been a village, and water was still found The country was very flat, being, by aneroid, at a general elevation of 106 feet above sea-level. From this place we proceeded on in a W N W. direction, passing through a thick wood of small trees and undergrowth. After leaving here the country became more undulating and the trees thinner, and it assumed a more park-like appearance—very like Natal in the first fifteen miles from the sea The soil was red loam on the hills and black in the valleys, and appeared eminently suited for sugar and coffee, water, though not on the surface, was to be had by digging a few feet About noon we passed a large baobab tree, on which was the Rev C Alington's name, and a few miles beyond was a well dug by the same gentleman Here we rested, and enjoyed a slight repast The hills over which we had come were about an average elevation of 200 feet No habitations of any kind, or any sign of cultivation, were to be seen, so utterly deserted both by man and beast is this tract of country. Starting again, and proceeding in a W N W direction still, we crossed a similar country, and arrived at the bottom of a steep hill crowned with coconut-palms, which as yet had been absent from the country On ascending the hill we arrived at a dense wood in which was situated the first village, called Yamba. Passing on in a north-east direction through the wood, we arrived at the top of the rise at the village of Umba, having done about 20 miles, or about 17 as the crow flies, pretty well tired after our first day's march Here we stayed for that night. The village lay inside the wood, apparently surrounded by four stockades, with coconut-palms growing plentifully among the huts, which were of an oblong shape with the corners rounded off, built of sticks and mud, with a thatch coming nearly to the ground The elevation of the village was about 500 feet, and the hill was the first regular ridge from the sea. Leaving Umba in the morning about 7 A M, we descended about 200 feet into a hollow on the other side of the hill, and in the first mile, making a south-westerly course, we crossed a small stream three times, which apparently ran to the south-west. The country was well cultivated here—mtama, mahindi, mbualzi, and sugar-cane being grown in patches Further on we skirted a dense wood, in which were many stockaded villages. Near one of these we were shown a hollow where, for native wars, a most bloody engagement took place between the natives of the country and the Wadigo, a northern neighbouring tribe, in which all the latter were ultimately surrounded and killed, otherwise native wars are very poor affairs, about 10 men being killed in a year's fighting After passing many villages, we at last mounted another ridge about 100 feet higher than the first, and found ourselves at the village of Nebué, where we halted We had walked about 6 miles. From here you could see across an undulating country, lower than the ridge, yet not flat, and beyond that, the spur of the mountain behind which Magila was situated After a short rest, we proceeded on in a W S W direction, turning, after we had walked some distance, in a more westerly direction, passing over hills and through a well-cultivated country, till we came to a small stream about 15 yards wide, and knee-deep, running in a N N E. direction, of which the banks were thickly wooded, which we were afterwards informed ran to Tanga. The bed of the river had an elevation of about 450 feet above the sea After crossing this river we passed through a flat, marshy country, where large quantities of rice were grown, and then ascended the spur before mentioned, which ran nearly north and south—the southern being the low end, while the northern formed two small and thickly-wooded peaks—after which it joined the general mass of the mountain Crossing this spur, we turned round to the north, walking in a N N W. direction, crossing several very steep hills (spurs of the larger one), and meeting our old friend the river, here running about south-east; then finally ascending a small hill, at the foot of which ran the river, we found ourselves at the Universities' Mission Station of Magila, at an elevation of about 120 feet above the surrounding country, and 600 feet above the sea; under the shadow of a lofty wooded mountain, and surrounded by a wooded and hilly country, that looked in the distance as if covered with one dense forest. The Station possessed a large house, built of poles and mud in the native fashion, but large and roomy, containing 6 good-sized rooms, covered with an ample thatch, whose extensive eaves formed a large verandah; standing on a platform of granite blocks (which stone abounded in the neighbourhood), chiefly of a grey and a reddish hue Also several smaller huts, an iron chapel and school-room, and a well-built cow- and hen-house stocked with a plentiful supply of firewood An avenue of bananas and other fruit trees led up the hill from the river on the one side, while the other was so steep that it took the greatest amount of care in walking to keep one from slipping down the whole distance, especially as the soil was a stiff red clay

During our stay at Magila I obtained the latitude by a meridian altitude of the sun, which gave it as 5° 6′ S.; as I had not much time, I did nothing for longitude, being dependent on the dead reckoning and bearings chiefly for distance. We also ascended the nearest peak to the station, walking up a most beautiful gully between the mountains by the side of a roaring torrent that formed one of the head-waters of the small river before mentioned, which formed rapids and cascades leaping over the rocks of granite, of which the mountain was composed. Some of the trees were very lofty, over 100 feet without a branch and above 6 feet in diameter, the natives call them "mvale" After ascending a good distance, the path left the gully, and passed through a small village, many of which are on the mountains, and some fields of mahindi, and then became very steep, and finally reached the top at a neck joining two peaks. The first one was about 1600 feet above the sea, and 1000 above Magila, the other was 2080 feet above sea-level. The view from the top was splendid, the whole country was spread out before you like a map, throughout nearly three-quarters of the circle from Wasoen to west of Tongwe Mountain. In general the country appeared flat, while the hidden quarter was filled up by the dark masses of the Kombora Range, the principal peak of which was hidden We could not see Pemba, though we heard guns fired at Zanzibar on the arrival of the Admiral The highest peak of this mountain mass I estimated at 3000 feet The mountain is chiefly granite, though I found sandstone of a dark-red colour and a very hard free-stone on the northern side Whilst we were at Magila we were visited by many of the surrounding people, and I made inquiries as to the existence and size of Lake Manyara. I was told that there was such a lake, that it was very large, and a man told me that its waters ran into the Rufu, or river of Pangani The great thing at Magila is trading with the Masai, or M'sai, as the people pronounce it We left Magila, after remaining there four days, and marched to Umba the first day, remaining there that night, and starting early the next morning we reached Marongo by sunset, here we remained two days, as it was Friday when we arrived there We were told that two dhows had left with 150 slaves, the night before we arrived, for Pemba, also several small, suspicious-looking dhows came and went away during our stay, always in the night We left on Sunday evening, and made a futile attempt to beat down the coast to Zanzibar, so after spending a night and half a day in an open boat in most tremendous showers of rain, we returned to Marongo, and two days after, when the rain abated a little, set out to walk to Pangani. We left Marongo in the morning early, and walked along the beach for about five miles, then turned inland to avoid some rocks, and, a shower coming on, we halted at a village where the people told Chumah that a gang of slaves had passed that morning further inland on their way to Marongo, going inland on purpose to avoid us, from Kilwa. After passing through a flat district, where we walked in water, we again struck the beach, and crossed a small river about nine miles from Marongo, which the natives call half-way. Here the footmarks of the slaves were plainly visible, as the sand was very soft and loose, which made walking very tedious. After leaving the river, a mile further on, we entered a mangrove forest which extended a long way into the water, leaving a narrow path between the sea and the bush on the shore, which was strewed with wreckage of all descriptions, pieces of kitandas or native bedsteads, dhow planks, figure-heads, masts of ships and boats. This forest was about three miles long After leaving this, we finally left the beach, and took a path across the country, and after walking about four miles, we found ourselves on the shores of Pangani Bay, about a mile from the town. We passed through a large plantation of coco-nut-palms, chiefly grown for "tembo," or the palm wine, and arrived at the town; where the Governor—a pompous old Arab, who treated us with scant courtesy, and gave himself more airs than the Sultan himself—after he had said his afternoon prayers, received us in a very dirty house, gave us sherbet which actually tasted nice and seemed refreshing, though it appeared to be the same as usual; but we were tired and dusty. He then dismissed us, and we retired to a Banyan's house, where we heard that a dhow belonging to the Customs' people was leaving that night for Zanzibar, so we took our passages, and reached Zanzibar early the next morning. We had been away altogether two weeks and two days

If it is ever intended to establish a settlement on the coast to prevent the slaves marching north, the country between Magila and the coast is admirably fitted for it by natural position and present circumstances. There is a good harbour, communication opened up with the interior, and a fertile tract of splendid sugar and coffee land, with no one to dispute the ownership, only waiting for some one to come and take possession, and in winter, at all events, it is not unhealthy, and free from mosquitoes

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5. *On a proposed Trade Route from the Gambia to Timbuctoo* By H. T. M Cooper, Administrator of the Gambia

Government House, Bathurst, River Gambia,
September 15th, 1875

Having seen a project on foot, the object being the opening up the resources of Central Africa, as likewise the lessening of the slave trade, and as it appears to me a vast undertaking, I therefore beg to offer a few remarks, and at the same time to enclose a chart* of a route which I consider easy and practicable for traders, and which only requires an expedition to be started to show the benefits which may be derived therefrom I have taken great pains in drawing up the course, and have gleaned the principal knowledge, outside my own personal experience, from Arabs and a man from Timbuctoo, and a native of Humdallahi, and who is perfectly trustworthy. I am confident that the reported richness of the country, and our opening up an intercourse with the natives in the far regions in the neighbourhood of the Sahara desert, would amply repay us for our trouble, besides be the making of this settlement, one feature of which is its noble river

You will perceive by the chart, that from Bathurst water-traffic can be had as far as Fattatenda, which is distant from St. Mary's Island about 280 miles. On reaching that place the traveller starts for Medina, King Jarrta of Woolie's town (our ally), from thence to Senoudebou, the capital of Bundoo, King Barcery Sarda, a great friend of ours, and who is decorated with the Legion of Honour, thence on to Kasso Madina, the country of King Samballa, who is the father-in-law of the King of Bundoo, and also our friend From Kasso you journey to Jambourk, where his territory ceases, and you are now within the territory of Amadoa, King of Segou (son of the late Alargi Maroo). From Jambourk you leave for Guematourou, and from thence to Macora, then on to Yamina, where there is a powerful chief, who is under the rule of the King, who resides at the next town, on the banks of the Niger, called Segou Sikoro. The extent of this King's territory ceases at his town.

At Yamina boats can be had, or long trade canoes After leaving Segou Sikoro the traveller is in the Arab country, called the Macini country. The King's name is "Abbadde," and he lives at his capital, called Humdallahi, which is on the right bank of the Niger From thence you proceed towards the Lake Debou, and here the above King's power ceases. Crossing the lake you come into the territory of the Foulahs, whose King's name is Alionde. The large town on the banks of the lake is called Mrawoona. The King resides at a place called "Chuke," some distance from the former You then proceed upwards, until you reach a town called Bourgbare; here the Foulah King's power ceases, and you are in the territory of the chief of the

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* Deposited in the Map-room of the Society.—[Ed]

Bourdarma and Tuwarnck tribes He lives at Timbuctoo, which is not far distant, and can be reached from Yamina the whole way by water.

DISTANCES.

From Bathurst to Fattatenda, if by steamer ..	2½ days.

By Foot

Fattatenda to Senoudebou .	3 days
Senoudebou to Kasso . ..	3 ,,
Kasso to Guematourou	10 ,,
Guematourou to Yamina	10 ,,

By Boat.

Yamina to Lake Debou . ..	10 days
Debou to Timbuctoo	8 ,,

These distances are supposed to be without stopping at any of the places for two or three days

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6. *Address to the Geographical Section of the 'British Association, at Bristol, August* 26, 1875.

By Lieut.-General R. STRACHEY, R.E., C.S.I., F.R.S., President of the Section.

In accordance with the practice followed for some years past by the Presidents of the Sections of the British Association, I propose, before proceeding with our ordinary business, to offer for your consideration some observations relative to the branch of knowledge with which this Section is more specially concerned.

My predecessors in this Chair have, in their opening Addresses, viewed Geography in many various lights. Some have drawn attention to recent geographical discoveries of interest, or to the gradual progress of geographical knowledge over the earth generally, or in particular regions. Others have spoken of the value of geographical knowledge in the ordinary affairs of men, or in some of the special branches of those affairs, and of the means of extending such knowledge Other Addresses again have dwelt on the practical influence produced by the geographical features and conditions of the various parts of the earth on the past history and present state of the several sections of the human race, the formation of kingdoms, the growth of industry and commerce, and the spread of civilisation

The judicious character of that part of our organisation which leads to yearly changes among those who preside over our meetings, and does not attempt authoritatively to prescribe the direction of our discussions, will no doubt be generally recognised. It has the obvious advantage, amongst others, of ensuring that none of the multifarious claims to attention of the several branches of science shall be made unduly prominent, and of giving opportunity for viewing the subjects which from time to time come before the Association in fresh aspects by various minds.

Following, then, a somewhat different path from those who have gone before me in treating of Geography, I propose to speak of the physical causes which have impressed on our planet the present outlines and forms of its surface, have brought about its present conditions of climate, and have led to the development and distribution of the living beings found upon it

In selecting this subject for my opening remarks, I have been not a little influenced by a consideration of the present state of geographical knowledge, and of the probable future of geographical investigation. It is plain that the field for mere topographical exploration is already greatly limited, and that it is continually becoming more restricted. Although, no doubt, much remains to be done in obtaining detailed maps of large tracts of the earth's surface, yet there is but comparatively a very small area with the essential features of which we are not now fairly well acquainted. Day by day our maps become more complete, and with our greatly improved means of communication the knowledge of distant countries is constantly enlarged and more widely diffused. Somewhat in the same proportion the demands for more exact information become more pressing The necessary consequence is an increased tendency to give to geographical investigations a more strictly scientific direction. In proof of this I may instance the fact that the two British naval expeditions now being carried on, that of the *Challenger* and that of the Arctic seas, have been organised almost entirely for general scientific research, and comparatively little for topographical discovery Narratives of travels, which not many years ago might have been accepted as valuable contributions to our then less perfect knowledge, would now perhaps be regarded as superficial and insufficient In short, the standard of knowledge of travellers and writers on Geography must be raised to meet the increased requirements of the time.

Other influences are at work tending to the same result. The great advance made in all branches of natural science limits more and more closely the facilities for original research, and draws the observer of nature into more and more special studies, while it renders the acquisition by any individual of the highest standard of knowledge in more than one or two special subjects comparatively difficult and rare At the same time the mutual interdependence of all natural phenomena daily becomes more apparent, and it is of ever-increasing importance that there shall be some among the cultivators of natural knowledge who specially direct their attention to the general relations existing among all the forces and phenomena of nature In some important branches of such subjects, it is only through study of the local physical conditions of various parts of the earth's surface and the complicated phenomena to which they give rise, that sound conclusions can be established, and this study constitutes Physical or Scientific Geography. It is very necessary to bear in mind that a large portion of the phenomena dealt with by the sciences of observation relates to the earth as a whole in contradistinction to the substances of which it is formed, and can only be correctly appreciated in connection with the 'terrestrial' or geographical conditions of the place where they occur On the one hand, therefore, while the proper prosecution of the study of Physical Geography requires a sound knowledge of the researches and conclusions of students in the special branches of science, on the other, success is not attainable in the special branches without suitable apprehension of geographical facts. For these reasons it appears to me that the general progress of science will involve the study of Geography in a more scientific spirit, and with a clearer conception of its true function, which is that of obtaining accurate notions of the manner in which the forces of nature have brought about the varied conditions characterising the surface of the planet which we inhabit

In its broadest sense Science is organised knowledge, and its methods consist of the observation and classification of the phenomena of which we become conscious through our senses, and the investigation of the causes of which these are the effects The first step in Geography, as in all other sciences, is the observation and description of the phenomena with which it is concerned; the next is to classify and compare this empirical collection of facts, and to investigate their antecedent causes. It is in the first branch of the study that most progress has been made, and to it, indeed, the notion of Geography is still popularly limited. The other branch is commonly spoken of as Physical Geography, but it is more correctly the science of Geography.

The progress of Geography has thus advanced from first rough ideas of relative distance between neighbouring places, to correct views of the earth's form, precise determinations of position, and accurate delineations of the surface. The first impressions of the differences observed between distant countries were at length corrected by the perception of similarities no less real The characteristics of the great regions of polar cold and equatorial heat, of the sea and land, of the mountains and plains, were appreciated, and the local variations of season and climate, of wind and rain, were more or less fully ascertained Later, the distribution of plants and animals, their occurrence in groups of peculiar structure in various regions, and the circumstances under which such groups vary from place to place, gave rise to fresh conceptions Along with these facts were observed the peculiarities of the races of men—their physical form, languages, customs, and history—exhibiting on the one hand striking differences in different countries, but on the other often connected by a strong stamp of similarity over large areas

By the gradual accumulation and classification of such knowledge the scientific conception of geographical unity and continuity was at length formed, and the conclusion established that while each different part of the earth's surface has its special characteristics, all animate and inanimate nature constitutes one general system, and that the particular features of each region are due to the operation of universal laws acting under varying local conditions. It is upon such a conception that is now brought to bear the doctrine, very generally accepted by the naturalists of our own country, that each successive phase of the earth's history, for an indefinite period of time, has been derived from that which preceded it, under the operation of the forces of nature as we now find them, and that, so far as observation justifies the adoption of any conclusions on such subjects, no change has ever taken place in those forces, or in the properties of matter This doctrine is commonly spoken of as the doctrine of evolution, and it is to its application to Geography that I wish to direct your attention.

I desire here to remark, that in what I am about to say I altogether leave on one side all questions relating to the origin of matter, and of the so-called forces of nature which give rise to the properties of matter In the present state of knowledge such subjects are, I conceive, beyond the legitimate field of physical science, which is limited to discussions directly arising on facts within the reach of observation, or on reasonings based on such facts It is a necessary condition of the progress of knowledge that the line between what properly is or is not within the reach of human intelligence is ill defined, and that opinions will vary as to where it should be drawn, for it is the avowed and successful aim of science to keep this line constantly shifting by pushing it forward; many of the efforts made to do this are no doubt founded in error, but all are deserving of respect that are undertaken honestly

The conception of evolution is essentially that of a passage to the state of things which observation shows us to exist now, from some preceding state of things Applied to Geography, that is to say, to the present condition of the earth as a whole, it leads up to the conclusion that the existing outlines of sea and land have been caused by modifications of pre-existing oceans and continents, brought about by the operation of forces which are still in action, and which have acted from the most remote past of which we can conceive, that all the successive forms of the surface—the depressions occupied by the waters, and the elevations constituting mountain-chains—are due to these same forces; that these have been set up, first, by the secular loss of heat which accompanied the original cooling of the globe, and second, by the annual or daily gain and loss of heat received from the sun acting on the matter of which the earth and its atmosphere are composed; that all variations of climate are dependent on differences in the condition of the surface, that the distribution of life on the earth, and the vast varieties of its forms, are consequences of contemporaneous or antecedent changes of the forms of the surface and climate, and thus that our planet, as we now find it, is the result of modifications gradually brought about in its successive stages, by the necessary action of the matter out of which it has been formed, under the influence of the matter which is external to it.

I shall state briefly the grounds on which these conclusions are based.

So far as concerns the inorganic fabric of the earth, that view of its past history which is based on the principle of the persistence of all the forces of nature, may be said to be now universally adopted This teaches that the almost infinite variety of natural phenomena arises from new combinations of old forms of matter, under the action of new combinations of old forms of force Its recognition has, however, been comparatively recent, and is in a great measure due to the teachings of that eminent geologist, the late Sir Charles Lyell, whom we have lost during the past year

When we look back by the help of geological science to the more remote past, through the epochs immediately preceding our own, we find evidence of marine animals—which lived, were reproduced, and died—possessed of organs proving that they were under the influence of the heat and light of the sun, of seas whose waves rose before the winds, breaking down cliffs, and forming beaches of boulders and pebbles, of tides and currents spreading out banks of sand and mud, on which are left the impress of the ripple of the water, of drops of rain, and of the track of animals, and all these appearances are precisely similar to those we observe at the present day as the result of forces which we see actually in operation Every successive stage, as we recede in the past history of the earth, teaches the same lesson The forces which are now at work, whether in degrading the surface by the action of seas, rivers, or frosts, and in transporting its fragments into the sea, or in reconstituting the land by raising beds laid out in the depth of the ocean, are traced by similar effects as having continued in action from the earliest times

Thus pushing back our inquiries, we at last reach the point where the apparent cessation of terrestrial conditions, such as now exist, requires us to consider the relation in which our planet stands to other bodies in celestial space, and vast though the gulf be that separates us from these, science has been able to bridge it. By means of spectroscopic analysis it has been established that the constituent elements of the sun and other heavenly bodies are substantially the same as those of the earth. The examination of the meteorites which have fallen on the earth from the interplanetary spaces, shows that they also contain nothing foreign to the constituents of the earth The inference seems legitimate, corroborated as it is by the manifest physical connection between the sun and the planetary bodies circulating around it, that the whole solar system is formed of the same descriptions of matter, and subject to the same general physical laws These conclusions further support the supposition that the earth and other planets have been formed by the aggregation of matter once diffused in space around the sun, that the first consequence of this aggregation was to develop intense heat in the consolidating masses; that the heat thus generated in the terrestrial sphere was subsequently lost by radiation; and that the surface cooled and became a solid crust, leaving a central nucleus of much higher temperature within. The earth's surface appears now to have reached a temperature which is virtually fixed, and on which the gain of heat from the sun is, on the whole, just compensated by the loss by radiation into surrounding space.

Such a conception of the earliest stage of the earth's existence is commonly accepted, as in accordance with observed facts. It leads to the conclusion that the hollows on the surface of the globe occupied by the ocean, and the great areas of dry land, were original irregularities of form caused by unequal contraction, and that the mountains were corrugations, often accompanied by ruptures, caused by the strains developed in the external crust by the force of central attraction exerted during cooling, and were not due to forces directly acting upwards generated in the interior by gases or otherwise It has recently been very ably argued by Mr. Mallet, that the phenomena of volcanic heat are likewise consequences of extreme pressures in the external crust, set up in a similar manner, and are not derived from the central heated nucleus

There may be some difficulty in conceiving how forces can have been thus developed sufficient to have produced the gigantic changes which have occurred in the distribution of land and water over immense areas, and in the elevation of the bottoms of former seas so that they now form the summits of the highest mountains, and to have effected such changes within the very latest geological epoch. These difficulties in great measure arise from not employing correct standards of space and time in relation to the phenomena Vast though the greatest heights of our mountains and depths of our seas may be, and enormous though the masses which have been put into motion, when viewed according to a human standard, they are insignificant in relation to the globe as a whole Such heights and depths (about 6 miles), on a sphere of 10 feet in diameter, would be represented on a true scale by elevations and depressions of less than the tenth part of an inch, and the average elevation of the whole of the dry land (about 1000 feet) above the mean level of the surface would hardly amount to the thickness of an ordinary sheet of paper The forces developed by the changes of the temperature of the earth as a whole must be proportionate to its dimensions, and the results of their action on the surface in causing elevations, contortions, or disruptions of the strata, cannot be commensurable with those produced by forces having the intensities, or by strains in bodies of the dimensions, with which our ordinary experience is conversant

The difficulty in respect to the vast extent of past time is perhaps less great, the conception being one with which most persons are now more or less familiar. But I would remind you, that great though the changes in human affairs have been since the most remote epochs of which we have records in monuments or history, there is nothing to indicate that within this period has occurred any appreciable modification of the main outlines of land and sea, or of the conditions of climate, or of the general characters of the living creatures, and that the distance that separates us from those days is as nothing when compared to the remoteness of past geological ages No useful approach has yet been made to a numerical estimate of the duration even of that portion of geological time which is nearest to us, and we can say little more than that the earth's past history extends over hundreds of thousands or millions of years.

The solid nucleus of the earth with its atmosphere, as we now find them, may thus be regarded as exhibiting the residual phenomena which have resulted on its attaining a condition of practical equilibrium, the more active process of aggregation having ceased, and the combination of its elements into the various solid, liquid, or gaseous matters found on or near the surface having been completed During its passage to its present state many wonderful changes must have taken place, including the condensation of the ocean, which must have long continued in a state of ebullition, or bordering on it, surrounded by an atmosphere densely charged with watery vapour. Apart from the movements in its solid crust caused by the general cooling and contraction of the earth, the higher temperature due to its earlier condition hardly enters directly into any of the considerations that arise in connection with its present climate, or with the changes during past time which are of most interest to us; for the conditions of climate and temperature at present, as well as in the period during which the existence of life is indicated by the presence of fossil remains, and which have affected the production and distribution of organised beings, are dependent on other causes, to a consideration of which I now proceed

The natural phenomena relating to the atmosphere are often extremely complicated and difficult of explanation; and meteorology is the least advanced of the branches of physical science. But sufficient is known to indicate, without possible doubt, that the primary causes of the great series of phenomena included under the general term "climate," are the action and reaction of the mechanical and chemical forces set in operation by the sun's heat varied from time to time and from place to place, by the influence of the position of the earth in its orbit, of its revolution on its axis, of geographical position, elevation above the sea-level, and condition of the surface, and by the great mobility of the atmosphere and the ocean

The intimate connection between climate and local geographical conditions is everywhere apparent, nothing is more striking than the great differences between neighbouring places where the effective local conditions are not alike, which often far surpass the contrasts attending the widest separation possible on the globe. Three or four miles of vertical height produce effects almost equal to those of transfer from the equator to the poles The distribution of the great seas and continents gives rise to periodical winds—the trades and monsoons—which maintain their general characteristics over wide areas, but present almost infinite local modifications, whether of season, direction, or force The direction of the coasts and their greater or less continuity greatly influence the flow of the currents of the ocean, and these, with the periodical winds, tend on the one hand to equalise the temperature of the whole surface of the earth, and on the other to cause surprising variation within a limited area Ranges of mountains, and their position in relation to the periodical or rain-bearing winds, are of primary importance in controlling the movements of the lower strata of the atmosphere, in which, owing to the laws of elastic gases, the great mass of the air and watery vapour are concentrated. By their presence they may either constitute a barrier across which no rain can pass, or determine the fall of torrents of rain around them. Their absence or their unfavourable position, by removing the causes of condensation, may lead to the neighbouring tracts becoming rainless deserts

The difficulties that arise in accounting for the phenomena of climate on the earth as it now is, are naturally increased when the attempt is made to explain what is shown by geological evidence to have happened in past ages. The disposition has not been wanting to get over these last difficulties by invoking supposed changes in the sources of terrestrial heat, or in the conditions under which heat has been received by the earth, for which there is no justification in fact, in a manner similar to that in which violent departures from the observed course of nature have been assumed to account for some of the analogous mechanical difficulties

Among the most perplexing of such climatal problems are those involved in the former extension of glacial action of various sorts over areas which could hardly have been subject to it under existing terrestrial and solar conditions; and in the discovery, conversely, of indications of far higher temperatures at certain places than seems compatible with their high latitudes, and in the alternations of such extreme conditions. The true solution of these questions has apparently been found in the recognition of the disturbing effects of the varying eccentricity of the earth's orbit, which, though inappreciable in the comparatively few years to which the affairs of men are limited, become of great importance in the vastly increased period brought into consideration when dealing with the history of the earth. The changes of eccentricity of the orbit are not of a nature to cause appreciable differences in the mean temperature either of the earth generally or of the two hemispheres, but they may, when combined with changes of the direction of the earth's axis caused by the precession of the equinoxes and nutation, lead to exaggeration of the extremes of heat and cold, or to their diminution, and this would appear to supply the means of explaining the observed facts, though doubtless the detailed application of the conception will long continue to give rise to discussions. Mr. Croll, in his book entitled 'Climate and Time,' has recently brought together with much research all that can now be said on this subject, and the general correctness of that part of his conclusions which refers to the periodical occurrence of epochs of greatly increased winter cold and summer heat in one hemisphere, combined with a more equable climate in the other, appears to me to be fully established

These are the considerations which are held to prove that the inorganic structure of the globe through all its successive stages—the earth beneath our feet, with its varied surface to land and sea, mountain and plain, and with its atmosphere which distributes heat and moisture over that surface—has been evolved as the necessary result of the original aggregation of matter at some extremely remote period, and of the subsequent modification of that matter in condition and form under the exclusive operation of invariable physical forces

From these investigations we carry on the inquiry to the living creatures found upon the earth, what are their relations one to another, and what to the inorganic world with which they are associated?

This inquiry first directed to the present time, and thence carried backwards as far as possible into the past, proves that there is one general system of life, vegetable and animal, which is co-extensive with the earth as it now is, and as it has been in all the successive stages of which we obtain a knowledge by geological research. The phenomena of life, as thus ascertained, are included in the organisation of living creatures, and their distribution in time and place. The common bond that subsists between all vegetables and animals is testified by the identity of the ultimate elements of which they are composed. These elements are carbon, oxygen, hydrogen, and nitrogen, with a few others in comparatively small quantities, the whole of the materials of all living things being found among those that compose the inorganic portion of the earth.

The close relation existing between the least specialised animals and plants, and between these and organic matter not having life, and even with inorganic matter, is indicated by the difficulty that arises in determining the nature of the distinctions between them Among the more highly-developed members of the two great branches of living creatures, the well-known similarities of structure observed in the various groups indicate a connection between proximate forms which was long seen to be akin to that derived through descent from a common ancestor by ordinary generation.

The facts of distribution show that certain forms are associated in certain areas, and that as we pass from one such area to another the forms of life change also The general assemblages of living creatures in neighbouring countries easily accessible to one another, and having similar climates, resemble one another; and much in the same way as the distance between areas increases, or their mutual accessibility diminishes, or the conditions of climate differ, the likeness of the forms within them becomes continually less apparent. The plants and animals existing at any time in any locality tend constantly to diffuse themselves around that local centre, this tendency being controlled by the conditions of climate, &c., of the surrounding area, so that under certain unfavourable conditions diffusion ceases.

The possibilities of life are further seen to be everywhere directly influenced by all external conditions, such as those of climate, including temperature, humidity, and wind; of the length of the seasons and days and nights; of the character of the surface whether it be land or water, and whether it be covered by vegetation or otherwise, of the nature of the soil, of the presence of other living creatures, and many more The abundance of forms of life in different areas (as distinguished from number of individuals) is also found to vary greatly, and to be related to the accessibility of such areas to immigration from without, to the existence, within or near the areas, of localities offering considerable variations of the conditions that chiefly affect life, and to the local climate and conditions being compatible with such immigration

For the explanation of these and other phenomena of organisation and distribution, the only direct evidence that observation can supply is that derived from the mode of propagation of creatures now living, and no other mode is known than that which takes place by ordinary generation, through descent from parent to offspring

It was left for the genius of Darwin to point out how the course of nature as it now acts in the reproduction of living creatures, is sufficient for the interpretation of what had previously been incomprehensible in these matters. He showed how propagation by descent operates subject to the occurrence of certain small variations in the offspring, and that the preservation of some of these varieties to the exclusion of others follows as a necessary consequence when the external conditions are more suitable to the preserved forms than to those lost The operation of these causes he called Natural Selection Prolonged over a great extent of time it supplies the long-sought key to the complex system of forms either now living on the earth, or the remains of which are found in the fossil state, and explains the relations among them, and the manner in which their distribution has taken place in time and space

Thus we are brought to the conclusion that the directing forces which have been efficient in developing the existing forms of life from those which went before them, are those same successive external conditions, including both the forms of land and sea, and the character of the climate, which have already been shown to arise from the gradual modification of the material fabric of the globe as it slowly attained to its present state In each succeeding epoch, and in each separate locality, the forms preserved and handed on to the future were determined by the general conditions of surface at the time and place, and the aggregate of successive sets of conditions over the whole earth's surface has determined the entire series of forms which have existed in the past, and have survived till now.

As we recede from the present into the past, it necessarily follows, as a consequence of the ultimate failure of all evidence as to the conditions of the past, that positive testimony of the conformity of the facts with the principle of evolution gradually diminishes, and at length ceases In the same way positive evidence of the continuity of action of all the physical forces of nature eventually fails But inasmuch as the evidence, so far as it can be procured, supports the belief in this continuity of action, and as we have no experience of the contrary being possible, the only justifiable conclusion is, that the production of life must have been going on as we now know it, without any intermission, from the time of its first appearance on the earth

These considerations manifestly afford no sort of clue to the origin of life. They only serve to take us back to a very remote epoch, when the living creatures differed greatly in detail from those of the present time, but had such resemblances to them as to justify the conclusion that the essence of life then was the same as now, and through that epoch into an unknown anterior period, during which the possibility of life, as we understand it, began, and from which has emerged in a way that we cannot comprehend, matter with its properties, bound together by what we call the elementary physical forces. There seems to be no foundation in any observed fact for suggesting that the wonderful property which we call life appertains to the combinations of elementary substances in association with which it is exclusively found, otherwise than as all other properties appertain to the particular forms or combinations of matter with which they are associated. It is no more possible to say how originated or operates the tendency of some sorts of matter to take the form of vapours, or fluids, or solid bodies, in all their various shapes, or for the various sorts of matter to attract one another or combine, than it is to explain the origin in certain forms of matter of the property we call life, or the mode of its action. For the present, at least, we must be content to accept such facts as the foundation of positive knowledge, and from them to rise to the apprehension of the means by which nature has reached its present state, and is advancing into an unknown future.

These conceptions of the relations of animal and vegetable forms to the earth in its successive stages lead to views of the significance of type (i.e., the general system of structure running through various groups of organised beings) very different from those under which it was held to be an indication of some occult power directing the successive appearance of living creatures on the earth. In the light of evolution, type is nothing more than the direction given to the actual development of life by the surface-conditions of the earth, which have supplied the forces that controlled the course of the successive generations leading from the past to the present. There is no indication of any inherent or pre-arranged disposition towards the development of life in any particular direction. It would rather appear that the actual face of nature is the result of a succession of apparently trivial incidents, which by some very slight alteration of local circumstances might often, it would seem, have been turned in a different direction. Some otherwise unimportant difference in the constitution or sequence of the substrata at any locality might have determined the elevation of mountains where a hollow filled by the sea was actually formed, and thereby the whole of the climatal and other conditions of a large area would have been changed, and an entirely different impulse given to the development of life locally, which might have impressed a new character on the whole face of nature.

But further, all that we see or know to have existed upon the earth has been controlled to its most minute details by the original constitution of the matter which was drawn together to form our planet. The actual character of all inorganic substances, as of all living creatures, is only consistent with the actual constitution and proportions of the various substances of which the earth is composed. Other proportions than the actual ones in the constituents of the atmosphere would have required an entirely different organisation in all air-breathing animals, and probably in all plants. With any considerable difference in the quantity of water either in the sea or distributed as vapour, vast changes in the constitution of living creatures must have been involved. Without oxygen, hydrogen, nitrogen, or carbon, what we term "life" would have been impossible. But such speculations need not be extended.

The substances of which the earth is now composed are identical with those of which it has always been made up; so far as is known it has lost nothing and has gained nothing, except what has been added in extremely minute quantities by the fall of meteorites. All that is or ever has been upon the earth is part of the earth, has sprung from the earth, is sustained by the earth, and returns to the earth, taking back thither what it withdrew, making good the materials on which life depends, without which it would cease, and which are destined again to enter into new forms, and contribute to the ever onward flow of the great current of existence.

The progress of knowledge has removed all doubt as to the relation in which the human race stands to this great stream of life. It is now established that man existed on the earth at a period vastly anterior to any of which we have records in history or otherwise He was the contemporary of many extinct mammalia at a time when the outlines of land and sea, and the conditions of climate over large parts of the earth, were wholly different from what they now are, and our race has been advancing towards its present condition during a series of ages for the extent of which ordinary conceptions of time afford no suitable measure These facts have, in recent years, given a different direction to opinion as to the manner in which the great groups of mankind have become distributed over the areas where they are now found, and difficulties once considered insuperable become soluble when regarded in connection with those great alterations of the outlines of land and sea which are shown to have been going on up to the very latest geological periods The ancient monuments of Egypt, which take us back, perhaps, 7000 years from the present time, indicate that when they were erected the neighbouring countries were in a condition of civilisation not very greatly different from that which existed when they fell under the dominion of the Romans or Mahometans hardly 1500 years ago, and the progress of the population towards that condition can hardly be accounted for otherwise than by prolonged gradual transformations going back to times so far distant as to require a geological rather than an historical standard of reckoning.

Man, in short, takes his place with the rest of the animate world, in the advancing front of which he occupies so conspicuous a position Yet for this position he is indebted not to any exclusive powers of his own, but to the wonderful compelling forces of nature which have lifted him entirely without his knowledge, and almost without his participation, so far above the animals of whom he is still one, though the only one able to see or consider what he is

For the social habits essential to his progress, which he possessed even in his most primitive state, man is without question dependent on his ancestors, as he is for his form and other physical peculiarities In his advance to civilisation he was insensibly forced, by the pressure of external circumstances, through the more savage condition, in which his life was that of the hunter, first to pastoral and then to agricultural occupations. The requirements of a population gradually increasing in numbers could only be met by a supply of food more regular and more abundant than could be provided by the chase But the possibility of the change from the hunter to the shepherd or herdsman rested on the antecedent existence of animals suited to supply man with food, having gregarious habits, and fitted for domestication, such as sheep, goats, and horned cattle, for their support the social grasses were a necessary preliminary, and for the growth of these in sufficient abundance land naturally suitable for pasture was required A further evasion of man's growing difficulty in obtaining sufficient food was secured by aid of the cereal grasses, which supplied the means by which agriculture, the outcome of pastoral life, became the chief occupation of more civilised generations. Lastly, when these increased facilities for providing food were in turn overtaken by the growth of the population, new power to cope with the recurring difficulty was gained through the cultivation of mechanical arts and of thought, for which the needful leisure was for the first time obtained when the earliest steps of civilisation had removed the necessity for unremitting search after the means of supporting existence. Then was broken down the chief barrier in the way of progress, and man was carried forward to the condition in which he now is

It is impossible not to recognise that the growth of civilisation, by the aid of its instruments—pastoral and agricultural industry—was the result of the unconscious adoption of defences supplied by what was exterior to man, rather than of any truly intelligent steps taken with forethought to attain it; and in these respects man, in his struggle for existence, has not differed from the humbler animals or from plants. Neither can the marvellous ultimate growth of his knowledge, and his acquisition of the power of applying to his use all that lies without him, be viewed as differing in anything but form or degree from the earlier steps in his advance. The needful protection against the foes of his constantly-increasing race—the legions of hunger and disease, infinite in number, ever changing their mode of attack or springing up in new shapes —could only be attained by some fresh adaptation of his organisation to his wants, and this has taken the form of that development of intellect which has placed all other creatures at his feet and all the powers of nature in his hand.

The picture that I have thus attempted to draw presents to us our earth carrying with it, or receiving from the sun or other external bodies, as it travels through celestial space, all the materials and all the forces by help of which are fashioned whatever we see upon it. We may liken it to a great complex living organism, having an inert substratum of inorganic matter on which are formed many separate organised centres of life, but all bound up together by a common law of existence, each individual part depending on those around it, and on the past condition of the whole. Science is the study of the relations of the several parts of this organism one to another, and of the parts to the whole. It is the task of the geographer to bring together from all places on the earth's surface the materials from which shall be deduced the scientific conception of nature. Geography supplies the rough blocks wherewith to build up that grand structure towards the completion of which science is striving. The traveller, who is the journeyman of science, collects from all quarters of the earth observations of fact, to be submitted to the research of the student, and to provide the necessary means of verifying the inductions obtained by study or the hypotheses suggested by it. If, therefore, travellers are to fulfil the duties put upon them by the division of scientific labour, they must maintain their knowledge of the several branches of science at such a standard as will enable them thoroughly to apprehend what are the present requirements of science, and the classes of fact on which fresh observation must be brought to bear to secure its advance. Nor does this involve any impracticable course of study. Such knowledge as will fit a traveller for usefully participating in the progress of science is now placed within the reach of every one. The lustre of that energy and self-devotion which characterise the better class of explorers will not be dimmed by joining to it an amount of scientific training which will enable them to bring away from distant regions enlarged conceptions of other matters besides mere distance and direction. How great is the value to science of the observations of travellers endowed with a share of scientific instruction is testified by the labours of many living naturalists. In our days this is especially true, and I appeal to all who desire to promote the progress of geographical science as explorers, to prepare themselves for doing so efficiently, while they yet possess the vigour and physical powers that so much conduce to success in such pursuits.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

[Published February 23rd, 1876.]

SESSION 1875-76.

Third Meeting, 13th December, 1875.

Major-General Sir HENRY C. RAWLINSON, K.C.B., President, in the Chair.

Presentations.—*Thomas A. Cragoe, Esq.; Joseph Laing, Esq.*

Elections.—*Edward Bickers, Esq.*, J.P.; *Edward Birkbeck, Esq.*; *Clare Ford, Esq.* (Chargé d'Affaires, Darmstadt); *Robert George Graham, Esq.; Richard B. Hanson, Esq.; Wilfrid Heeley, Esq.; Edward W. Hodge, Esq.; Thomas Frank P. Kavanagh, Esq.; Albert Lee, Esq.; Maurice John Lothian, Esq.; Colonel G. McAndrew; James Macauley, Esq.; John Rahles, Esq.; Major John Ramsay; T. F. Ryder, Esq.; Arthur G. Stirling, Esq.; William Westgarth, Esq.; Montague Williams, Esq.*

Donations to the Library, from 29th November to 13th December, 1875.—Archæological Survey of India, by Alexander Cunningham, vols. i.—v., 1871–75 (*H.M. Secretary of State for India*). South Australia: Mr. Ernest Giles's explorations, 1872, Colonel Warburton's explorations, 1872–73, and Mr. J. Ross's explorations, 1874 (*H.M. Secretary of State for the Colonies*). Report of the Meteorological Reporter to the Government of Bengal for 1874, Administration Report for 1874–75, and Report of the Midnapore and Burdwan Cyclone of October, 1874, by W. G. Willson (*The Meteorological Office, Calcutta*). United States Hydrographic Office: West Coast of Africa, part 2 (*The Office, through Commodore Wyman*). England and Russia in the East, by Sir H. Rawlinson, 2nd edition, 1875; Handbook for Travellers in Norway, 5th edition, 1874, Handbook for Travellers in Denmark, with Sleswig and Holstein, 4th edition, 1875; and Handbook for Travellers in Sweden, &c, 4th edition, 1875 (*John Murray, Esq*) Die Zweite Deutsche Nordpolarfahrt, 1869 and 1870 Volksausgabe, Leipzig, 1875 (*The Bremen Arctic Society, through Dr. Lindeman*). Catalogue of the books in the Admiralty Library, by Richard Thorburn, 1875 (*Author*). Outlines of Indian History, 1871, and Gazetteer of the province of Sindh, 1874, by A W Hughes (*Author*) Projet d'un Canal inter-océanique par le Nicaragua, par A. P. Blanchet, Bourges, 1874 (*Author*) La Végétation du Globe, par A. Grisebach, traduit par P. de Tchihatchef, vol i, part 2 (*M de Tchihatchef*) Transactions of the Chronological Institute, vols i, ii, parts 3 and 4, vol iii, part 1, Transactions of the Syro-Egyptian Society, 1867–68, and Original papers, vol i., parts 1 and 2 (*The Society of Biblical Archæology*) Die geographische Aufstellung . . . Paris, and Der Golf und Polarstrom im Ost-Spitzbergischen Meere, Wien, 1875, by Joseph Chavanne, and Die Verhandlungen des internationalen Congresses . . . . Paris, von F. v. Hellwald and J. Chavanne, Wien, 1875 (*Dr. Chavanne*). Aperçu de l'état de nos connaissances géographiques, &c, 1875, Rapport sur le concours au prix annuel, &c, 1875, and La France Vinicole, 1875, par V A Malte-Brun (*Author*) Account of the Survey of the Russian Empire during the reign of Alexander II. (in Russian), by J Stralisky, St Petersburg, 1874, and Les Voyageurs Russes en Asie, 1854–74 (*M. Veniukoff*), and the current issues of corresponding Societies, &c

The President, in introducing the subjects of the evening, said the first paper was one referring to New Guinea, and the other to Madagascar The first consisted of a letter recently addressed to the Society by one of its members, who, visiting in the course of his travels the northern part of Australia, had accompanied the mission sent out by the London Missionary Society, and with the head of that mission, the Rev Mr M'Farlane, had ascended a river on the southern coast for a distance of nearly 100 miles—the furthest point in the interior yet reached in that part by any European traveller This journey was performed in the steamer *Ellengowan*, which had been presented to the London Missionary Society by a liberal-minded lady at Dundee, Miss Baxter, and it was proposed to call the newly-discovered river the Baxter River, in her honour After the paper was read, Dr Mullens, the Foreign Secretary of the Society, would give some additional facts from the Rev. Mr M'Farlane's journals.

1.—*Discovery of the Mai-Kassa, or Baxter River, New Guinea.*

By Octavius C. Stone, f.r.g.s

Mouth of the Mai-Kassa, New Guinea,
Sept 7th, 1875

Sir,

In my last letter to you, written from Somerset, Cape York, I had the honour to inform you of a vague report that reached me through some pearl-shell fishers, of a river near to Boigu, said to be navigable, although they themselves had not ascended it. This intelligence would appear to have been communicated to them by some of the missionary native teachers, who had gone up some few miles in a sailing-boat, and found it continue of great width. It was therefore decided upon by the Rev S M'Farlane, the head of the New Guinea Mission, to ascertain the truth of any such report, with the purpose of endeavouring to establish the mission as far in the interior as possible should the country be found suitable I was invited to accompany the reverend gentleman, and it is therefore to his kindness that I must attribute the information contained in the account of our voyage up the Mai-Kassa, or Baxter River, in the London Missionary Society's steamer *Ellengowan*, presented by Miss Baxter of Dundee, after whom the river will be called, should your Society be pleased to accept the name Although personally objecting to alter native names when they can be ascertained, I cannot but concur in intimating the Rev S M'Farlane's desire in this matter, and to honour thereby the noble-hearted donor of the *Ellengowan*, by whose means this river has been ascended, and we have been able to penetrate further into the interior of this *great unknown* country than any previous explorer or expedition Although the results have not been *quite* so satisfactory as I had hoped, yet in some respects it has been more so We have found a river navigable for any ordinary-sized steamboat 60 miles in the interior, whose width averages from one mile to one quarter, and depth from twelve to three fathoms It is likewise navigable for small boats to a further distance of 30 miles, making a total of 90 miles, but by clearing away logs and branches that choke it up at that point, it might be made navigable for many miles further, as the depth at the furthest extremity I went to is 1½ fathom. I will, however, with your permission, give you but a *short* account of our voyage of discovery, as my time on re-arriving at Somerset will be wholly occupied in preparing to start for the east side of the gulf, Port Moresby, where I hope to remain three months. I beg to enclose you a chart of the Mai-Kassa, or Baxter River, that I have laid down, of which another has been made for the London Missionary Society.

I have the honour to be, Sir,
Your obedient servant,
Octavius C. Stone.

Sir H. C. Rawlinson, K.C.B, &c.

Somerset.

P.S.—I take this opportunity of informing you that I am sending a few curiosities of the Daudé Papuans to England by this mail; and thinking some of your Society might like to see them on their way to Leicester, have taken the liberty of addressing them to the Society's rooms to be detained at pleasure, and then kindly forwarded. At the same time I beg to send you specimens of the earth, and a few leaves of certain plants found on the banks of the Mai-Kassa, which I regret are not more numerous and better preserved. With these latter please do as you think well. I enclose herewith some photographs of Erub natives, who are of true Papuan origin, and similar in physique to all the other Straits' islanders I have seen.

The *Chevert* is at Somerset, having returned from Yule Island with Mr Macleay and the remainder of the Sydney Expedition on board—many of whom are going back disappointed, including the leader.

We left Somerset, Cape York, on the 25th of August in the steamer *Ellengowan*, belonging to the New Guinea Mission, and after calling at several of the Straits Islands on our way, the Rev S M'Farlane and myself arrived at Boigu on the 30th of the same month. Our object was to penetrate as far as possible up a river lying to the north of Boigu some 6 miles, the existence of which we had accidentally heard of before leaving, as having a mouth 2 miles wide, and being very deep. This was confirmed on our way by some of the native teachers, who had ascended it for a short distance and found it did not alter in appearance. Four of those men—natives of the Loyalty Group—we took with us, having picked them up at Mabuagi, Saibai, and Tauan. We dropped anchor 1 mile north of Boigu, from which place the mouth of the new river was visible in a north-by-west direction, though at that distance it might have been mistaken for a bay or inlet of the mainland of New Guinea. The channel thither has recently been surveyed, but numerous reefs and sand-banks not marked on the chart cause the navigation of Boigu Pass to be one of risk and danger, although there is little or no doubt that when it becomes better known, a suitable passage to the mouth of the Mai-Kassa, or Baxter River, will be found. In the afternoon of the 30th we went sounding in a sailing-boat, taking some of the native teachers. A sand-bank lay 1 mile to the north, so we steered half a mile to the east of it and then took a new course for 3 miles, crossing over a reef, extending in a semicircle from the left (east) bank of the river for a considerable distance, at a radius of 1½ or 2 miles. Although it was high-water at the time, we found but 2 fathoms in the shallowest part, so that as the rise and fall of the tide is 8 feet, this entrance would seem to be impracticable. After passing this it deepened gradually, until we found ourselves entering the mouth of a large river situated in long. 142° 18′ E., and lat. 9° 8′ S. The sight of this large river-mouth delighted us, as it was seen extending far away in a northerly direction, being a mile in width, while its entrance was nearly double that breadth and 10 fathoms deep. Smoke was now observed arising from the adjoining mangrove-trees, and we soon noticed 14 natives, who we afterwards found were Boigu people, and two out-rigger canoes on the left bank. At a couple of boats' length from this bank we floated in 3 fathoms of water, and instead of finding swamps we landed on terra-firma In this respect it differed so much from the Katau that we hoped to find it continue so all the way, but in this we were destined to disappointment. The trees grew to 50 or 60 feet in height, with tall straight trunks from 5 to 10 inches in diameter, but they were insignificant when compared with those we saw higher up. The natives brought coco-nuts and yams to us, but during our after-voyage we only noticed a dozen coco-nut trees. They had speared a dugong weighing half a ton, and were cooking it in pieces upon a log fire, supported on coral stones to convey the necessary draught They seemed glad to see us, but were perfectly naked, a pearl shell, cut in the shape of a quarter moon, called a mari, being suspended from their necks, falling over a portion of the breast, while their ears were pierced all round, and the lobes artificially elongated and then cut so as to hang down nearly to the shoulder Some wore wigs like mops, their heads being first shaved with pieces of glass or shell, and this wig is common among the Papuans and the islanders of the Straits and Gulf of Papua. We were told by these men of an immense bird that they said is found up the river, which can "lift up a dugong and turn over turtle"—though native statements are usually greatly exaggerated and not reliable Can this, however, be the moa, thought to be extinct? The megapodius must be abundant, as we saw a nest of this fowl 10 feet high by 90 in circumference, and other smaller ones. The natives know nothing of the river further up, for they say, "When we have sea here, what for do we want to go to the sea there?" It is evident that they believe it cuts the land in half, such is their ignorance. We returned to the steamer by taking a due southerly direction, and then turning to the east, when 1 mile distant from the island, and another day's sounding proved this to be the safest course It was impossible, however, in the short time at our disposal to lay down these reefs and innumerable sand-banks with any great degree of certainty—they seemed endless, appearing in every direction at low-water.

New Guinea—or Koi-lago (the Big Land), as called by the Boigu and Saibai people, and Daudé by the aborigines of that part of the land visible from the sea—is seen stretching out in the distance east and west as far as the eye can reach, in a low line of mangrove-trees rising from out of the sea, with no undulation or raised ground of any description in sight. Nothing could look less inviting than what we considered were great swamps, extending we knew not how far inland, but that uncertainty, combined with the prospects, however remote, of finding a road through them into the far interior, and perhaps bringing many new features to light, only gave us increased hope The Boigu, Saibai, and Tauan people are one and the same tribe, speaking a similar tongue, which differs but slightly from the language spoken in the Straits, excepting Erub, Murray, and Stephens, which speak a perfectly different tongue from any of those before named. By nature these people are bloody and warlike among themselves, frequently making raids to the "Big Land," and returning in triumph with the heads and jaw-bones of their slaughtered victims—the latter becoming the property of the murderer, and the former to him who decapitates the body The jaw-bone is consequently held as the most valued trophy, and the more a man possesses the greater he becomes in the eyes of his fellow-men. When at Saibai I tried in vain to procure a jaw-bone from 100 others, placed together in a bundle upon a stick, together with five skulls, but I could only procure the latter, which the murderer sold for a piece of tobacco. While walking in the forests at Boigu I came upon some forty human skulls, covered with dead leaves they were those of men and of women, but I saw none belonging to a child, and all were greatly decayed. Only a fortnight before our arrival, a war-party had gone over in three canoes to the mainland, armed with clubs, spears, tomahawks, bows and arrows They suffered the loss of four men and returned. The Papuans on the mainland hold these people in great dread, for, in combination with the Saibai and Tauan tribe, they scour the country and return generally victorious

On Wednesday, the 1st of September, we raised anchor and steered the *Ellengowan* towards the mouth of the New River. It was thought advisable to wait until low-water, in order that if she should run on any reef or bank the flowing tide would soon raise her. We steamed 3 miles to the west, and were then making for the mouth in a north-by-east direction, when she stuck upon a soft sand-bank that ran north by south, curving round to the east at its northern extremity. The precaution was a good one, and in an hour we floated off and entered the Mai-kassa or Baxter River at 2 30 P.M., without further mishap, in 10 fathoms of water, to the tune of "Marsch Herzliebchen mein," played upon an organ brought to astonish the natives. In the whole course of our after-journey, however, only *one* native and canoe were seen, although the distance was 91 miles! Smoke was again seen rising in large volumes a couple of miles on the left bank, but no other signs of life were visible. All around presented an interminable forest of mangroves, rising chiefly from out of the water, though dry land was occasionally passed by which never exceeded 20 feet, even half this height being extremely rare, for at high-water the roots of the mangrove-trees were mostly submerged for a considerable distance inland. Six miles up we passed a wide river, nearly half a mile across, extending in an easterly direction, and then bearing to the north-east, and about 2 miles further we noted another river, half that width, on the opposite bank, flowing towards the west. Ten miles up we observed coco-nut trees growing near to the eastern bend of the river, and the native teachers who had been so far informed me there was fresh water to be procured at the spot. Shortly after, at a turning to the west, we remarked what appeared to us to be stone or rock rising out of the water It was the first ground of this description we had seen, and we greeted its appearance with pleasure, as we hoped some change in the monotonous kind of scenery was about to take place shortly The only circumstance that tended to damp our spirits was, that the water became no fresher as we proceeded, and that the tide continued to rise and fall, as heretofore at the sea. We anchored for the night 15 miles up, and early the next morning we sailed back to Stony Point, accompanied by Captain Runcie, of the *Ellengowan*, and we then perceived that the shore at that point is composed of pipe-clay, rising perpendicularly 6 feet above the water, and extending 8 feet beneath. Minute oysters, in the first state of formation, were adhering to it, and a few other shell-fish, common on the Australian coast The soil 100 yards inland was of a rich vegetable nature, while that in close proximity to the river was dry and clayey. The ground rose to a height of 12 feet, and was covered with the customary tall trees, from 50 to 70 feet high, among these the mangrove being predominant. Patches of long coarse grass grew here and there upon the ground, moss clung to the roots and lower parts of the trunks of the larger trees, and undergrowth was plentiful, though not so dense as among the Australian bushes. A species of thistle and a bush, bearing leaves not unlike those of the box, only armed with thorns, were common. A swamp, about a quarter of a mile inland, prevented us from exploring further. The bed of the river is composed of mud and clay, containing myriads of microscopic shells and particles of shell, but entirely devoid of any harder material, excepting a stone, somewhat resembling ironstone, scattered sparsely over it. At noon we continued steaming up the river, which at 25 miles' distance turned off from a northerly to a westerly direction, continuing to run in that direction for the next 20 miles through low and swampy country. At the twenty-second mile from the mouth two reefs projected above the water, and on taking the ship's small boat to examine them, they were found to consist of pipe-clay, similar to the bank at Stony Point. A few miles on we observed smoke rising in great clouds about 2 miles inland, but no canoe or other sign of life was visible Numerous streams are passed on either side of the river, some being of considerable width and varying from 10 to 150 yards At the fortieth mile we saw smoke again on the left bank, and a native in the act of paddling his canoe leisurely from the opposite side towards it. He had paddled a quarter of the distance, and was then seen to stop for a moment as though thunderstruck on observing the big machine coming quickly towards him Orders were given to steam full speed; but before we could get up to him he turned back in evident terror, tied his canoe to a bamboo stuck into the mud, and ran off inland. This was the first and last man or canoe we had come across It is a most difficult thing to get near these people, who regard all strangers as enemies They seem to lead a roving life, like the bush-tribes of Australia, hunting with the bow and arrow, and spearing fish. The canoe in question was about 15 feet long by 18 inches across, hollowed from the solid trunk of a tree and pointed at one end, proving they are not ignorant of the advantage a boat of that shape possesses It is evident that all this part of Papua is very thinly populated, no doubt accountable for by the malaria that rises during the rainy season and the heavy night-dews during the dry, which cannot but produce a most unhealthy atmosphere. I was assured that a night passed on shore was sufficient to cause fever, but notwithstanding this, I found the climate, while travelling through the country by boat, sufficiently agreeable, the temperature at noon in the shade being 87°, and in the early mornings and evenings 7° less, while in the sun it reached 115° this, however, is the coldest part of the year. Forty-five miles up we came to the junction of a river flowing from the interior into the channel along which we had steamed, the junction being called the "Meeting of the Waters."

Here the current ran at 4 miles an hour, and the steamer drifted down until anchor was dropped, for we felt convinced that this current was produced by the river whose mouth we had just passed. In consequence of the rapidity of the current, one of the boats that was being towed behind came in contact with the propeller and was carried beneath the water, and although it was finally rescued, it was rendered useless for the rest of the voyage. I mention this incident merely as a caution to any who may hereafter ascend the Baxter We anchored 2 miles further up, having returned and taken the turn eastwards

On the following morning (September 3rd) our men went ashore to cut wood, and the Rev S M'Farlane and myself likewise landed to explore the neighbourhood The ground rose to 30 feet, being thickly carpeted with a long coarse grass that made walking somewhat difficult For the most part it was rich alluvial black soil, but at one mile inland we came to boggy land, when the soil became more of a peaty nature. Immediately adjoining the river's side red and yellow clay, and a stone, like ironstone, imbedded in it, were plentiful. We noticed the traces of wild boar, and evidence of the presence of natives at some period was visible in the charred trunks of a few trees and pieces of charcoal lying here and there. All, however, that I saw in the form of life were a few birds, butterflies, and dragon-flies Fresh water was likewise found by the men, and our water-casks were replenished Up to this time we had some doubts as to the supposed river turning out to be but a creek, but the indications of the salinometer cleared away all fear we entertained on that score. We steamed on the same day, and shortly discerned among the trees the first hut since entering the mouth, 50 miles away, but no signs of life appeared within or without it. The river now took a northerly direction, and the banks became higher, though never exceeding 30 feet, and the interminable mangroves were backed by forest trees, 70 or 80 feet high The stillness and quietude of all around were striking, being only broken by the sound of an occasional bird. On the banks, where life in some form would certainly have been expected to exist among beast, fowl, fish, or reptile, all was silent as the grave, for not so much as an alligator or crocodile cheered us by his presence Perhaps a dozen birds were as many as we had noticed in a single day, among which were the common white crane, white pigeon, black and white cockatoos, and parrots. As we proceeded, brown birds, having the appearance of hawks, were seen flying from one side of the river to the other, and palm-trees added a more tropical aspect to the scenery, but no more coco-nut trees, or other useful fruit or vegetable, were passed to our knowledge. On arriving at the sixty-fourth mile—Wood Bay—we cast anchor, for the river there split into two, and narrowed so considerably that we were undecided as to which course to take. We sounded in a small boat and found that the silt from both rivers formed banks at either bend, though in the centre they were 2½ and 3 fathoms—the river, branching to the north-east, being the deeper and wider of the two. We therefore sounded for 3 miles' distance, the average depth being 2½ fathoms at slack tide, and the rise of tide 6 feet The water is strongly brackish, so more fresh water was searched for and found about 2½ miles up on the right bank On the left bank, at the third bend, bamboos grew abundantly, some having been recently cut, not by stone hatchets or other rough instrument, but by some sharp instrument, no doubt steel hatchets This was self-evident from bamboos, 3 inches across, having been severed in two strokes. The Katau people have many of these steel axes, procured by barter, hence it is probable that they have intercourse with these people, and that the existence of a white race is not altogether unknown among them A raft, composed of a bundle of sticks tied together, was attached to some overhanging bushes, but although no owner was seen, it had disappeared the following day. I visited a shelter, constructed from the bark of the gum-tree, that was situated in Wood Bay, and saw signs of recent life in the remains of a kangaroo, which had been cooked upon a log-fire. These shelters seem to afford homes to these roving people, while wandering from one place to another, and I am in great doubt whether half this population has any sort of home or shelter at all They pass two or three nights beneath them, hunting in the meanwhile, lengthening or shortening their stay, as game is found to be more or less plentiful. No wonder that, with such a scarcity of nourishment as they are able to get, they have a liking for human flesh

Early on September 4th we sounded 3 miles up the north-western river, but at that distance it narrowed to 50 yards, although the depth was from 1½ to 2 fathoms Our minds were fully made up as to which course to take, so, when it was still early, the Rev. S. M'Farlane and I, accompanied by Captain Runcie, started off in the life-boat, as we found continuing further in the steamer would be accompanied with some risk of being unable to turn her round, notwithstanding that there was sufficient water to float her, not only in the centre, but also near the sides. The length of the *Ellengowan* is 80 feet, and she draws 6 feet of water. This confluent, at its junction with the recipient, was about 200 yards wide, but it narrowed so perceptibly and rapidly as we proceeded in the life-boat, and took such sharp windings, that we should have experienced some difficulty in steering a large boat, although it could have been turned round in Wide Bay, some 8 miles further up than Wood Bay, where she was anchored Palm-trees, or more properly leaves, 30 feet in length, now became numerous, growing out of the water on either side, while mangroves, hitherto abundant, became scarce. The water was tried and found to be brackish, but it became fresher and fresher, until, at 16 miles from the junction, the surface-water was found to be perfectly drinkable. The banks, too, were higher than they had been, and on landing at several places dry land, capable of being cultivated, and extending far inland, was seen, though running streamlets and patches of swampy ground here and there were visible. Where the latter abounded, broad coarse grass grew to a height of 4 or 5 feet, among which snakes were not uncommon Elsewhere the ground was covered by a small species of bamboo, resembling cane, and strewed with their dead leaves, or else by forests of tall trees, having their lower parts hidden by bushes, small trees, and other undergrowth. Upon these, orchids and creepers find support, but the former cannot be called plentiful. Indeed, in no part of the world have I seen these so abundant as in the Mergui Archipelago and parts of Burma.

At the distance of 15 miles above the junction we noticed a clear space on the left bank that seemed to extend some distance inland, as was judged by the tall charred trunks seen rising one behind another, totally devoid of branches. It was evident that they had been subjected to the action of fire, so Captain Runcie and I landed to examine the neighbourhood, in the hope of discovering signs of life Wending our way through grass 5 feet high, we suddenly came upon a neat fence, made of branches interlaced, 4 feet 6 inches high, and supported by poles driven in the ground, 3 feet 6 inches apart It enclosed an area of no less than 6 acres, and was so compactly constructed that it was with difficulty a holding-place could be found to pull oneself up by It had been erected some time past, as on climbing over it was unable to bear my weight, and fell in with a crash The grass within was neither so coarse nor long as that outside, showing it had been more recently fired In some parts it was cultivated with yams, sugar-cane, and, what most of all astonished me, tobacco. This was the first signs of cultivation (excepting the few coco-nut trees before mentioned) that we had seen, and it gave us renewed hopes of meeting natives further up. Outside the enclosure, and situated beneath overhanging shrubs on the river-bank near a bend a mile further up from where our boat was left, we found two bark-huts, but no inhabitants. The remains of burnt stones that had formed a foundation for their last fire were still as they then left them, but the huts were perfectly empty. The height of these habitations was about 6 feet, width the same, and length 14 feet, the ends being left open, while the sides and sloped roof were of bark, supported on thick sticks. When I went there again, two days afterwards, I suspended a knife and a looking-glass from the roof of one of them, to delight and astonish the proprietors on their return, when the yam season sets in. A few miles further, we arrived at Cascade Point, 82 miles from the mouth, where a small stream of pure, sparkling water rushes through a gap in the left bank, and falls, from a few feet in height, into the river below At this point the Mai-Kassa narrows to 20 yards, the banks becoming more perpendicular, while the depth is 2½ fathoms in the middle, and from 1 to 2 fathoms at the sides. The same kind of forest scenery characterises the shores extending as far away inland as the eye is able to reach, which, on account of the undergrowth and flat nature of the country, is, however, extremely limited On returning by moonlight, fire-flies congregated in thousands upon certain trees, for whose leaves they appeared to have a particular liking, which, being reflected in the smooth water, gave a natural illumination of striking beauty and brilliancy.

On the following Monday (September 6th), while more wood was being cut for the steamer, I borrowed the life-boat, and started at three o'clock in the morning, accompanied by Mr Smithurst, the engineer of the *Ellengowan*, with the intention of proceeding as far as possible up the river within the limited time of one day. Two South Sea Islanders acted as rowers, and we soon arrived at Cascade Point, the furthest point reached two days previously Immediately on leaving there again, birds of many kinds became numerous, each mile we went appearing to double in quantity those seen in the preceding one. Pigeons, half as large again as ordinary ones, and of a beautiful lavender colour, with chocolate wings and red eyes, flew about in every direction, while cockatoos and parrots of many colours, herons and king-fishers, were common, lending an air of life to the locality that differed very much from anything we had before come across A large bird, which must have measured from 14 to 16 feet across the wings, with black and white about its body, was also seen flying high in the air, and the flapping of whose wings resembled the sound of steam issuing from the front of a locomotive. The river zigzagged considerably, and became so narrow, that at a distance of 9 miles past Cascade Point, or 91 from the mouth, the leaves of the palm met in the centre, forming a natural arch, beneath which we rowed Logs, trunks, and snags, were now so thickly scattered in the river as to entirely block us from going any further, and we returned to the nearest landing-place, at Snake Bay. At the furthest point reached, the Mai-Kassa was 10 yards wide, although the depth was still 2 fathoms Even so far in the interior it is influenced by four half-tides daily, as when the first waters meet the sea a rebound is caused, so that the second half-tide is of slightly longer duration than the first The rise of tide at the furthest point is from 3 to 4 feet, but its waters are entirely fresh It is on account of the sluggish motion and continued depth of this river that I am induced to believe it may run for another 100 miles into the interior, and it would be interesting to further trace its course Birds of Paradise, which we had occasionally seen in coming the last 4 miles, were found to be plentiful at Snake Bay, and three of these beautiful creatures were shot in the short time we stayed there The body and wings are brown, top of head, yellow; throat, emerald green; breast, purple, while the feathers constituting the under part of the bushy tail are of a reddish tint, gradually dying off to brown at the extremity A boa-constrictor was likewise shot, 15 feet 3 inches long, having a protuberance in his body 14½ inches in diameter, which, when cut open, proved to be the body of a whole kangaroo only partially digested We remarked, near the water's edge, footprints as of some large animal such as a bull would make, though the natives of Boigu inform us there are no such animals, but wild boar are often captured by them The footprints in question were, however, 5 inches in diameter, and the same depth in the soft mud—though no hoof-mark could be seen That they were those of some animal other than human is beyond the question of doubt, but the animal that produced them is a mystery. The trees in the vicinity of Snake Bay are of enormous height, many being more than 100 feet, though few exceed 4 feet across the trunk, which grows perfectly erect, and is devoid of lower branches. The height of these trees was characteristically expressed by the South Sea Islanders in the term "break-neck," as applied to them on account of having to bend the head back considerably when looking up, but, like many other of their expressions, it conveys an exaggerated idea of their grandeur The wood is very hard, and suitable for cutting up into planks for ship-building and other purposes. The bark on most is smooth, and on some I observed a fatty, resinous substance adhering, reaching to a height of 40 feet from the ground, and forming a sort of buttress down one side, projecting 6 inches, and being from 3 to 4 inches in width. When burnt in the fire it gave out a cheerful flame, and possessed all the requisites for making candles of Flowers are scarce, and, indeed, the only two we have seen worthy of notice are the pitcher-plant and a white lily, several blooms growing at the extremity of a stem 2 or 3 feet long The shades of evening were closing around us as we left Snake Bay, and after a long pull with the current, which there averages 2 miles an hour, arrived back safely at Wood Bay, being received by those on board with cheers that alone broke the silence of night Here and there the reflection of large fires was seen in the heavens, and sometimes a flame would leap up above the dark trees; but no living thing was seen, and no voice or sound was heard, excepting within the iron walls of the *Ellengowan* While waiting at Cascade Point and Snake Bay, Mr Smithurst had succeeded in taking photographs with his apparatus, so that a good idea of the general character of the scenery in the interior will therefore be obtained

At an early hour on Tuesday, September 7th, we steamed full-speed down the river, not stopping until arriving at its mouth, in 8 hours 55 minutes Before leaving Wood Bay, however, the likeness of Her Majesty Queen Victoria was placed within a suitable niche cut out of the trunk of a tree, the flag was hoisted, and a royal salute of twenty-one guns fired. On the 12th of September we re-arrived in Somerset, having been absent only eighteen days

In conclusion, I would remark that for the naturalist and botanist the shores of the Mai-Kassa, or Baxter River, present features of attraction that are rarely equalled, when we take into consideration the comparative immunity from danger while in the pursuit of scientific inquiry, combined with the ease with which they may be approached—both being considerations of no small importance. That the southern part of New Guinea is either cut up into a series of islands, or intersected by rivers and streams of considerable length, is beyond doubt, and, in a geographical point of view, the tracing out of these numerous effluents of the Mai-Kassa would afford an interesting study, and might lead to further important results, and, with a steam-launch drawing 3 feet of water, this could be easily accomplished in a few months.

OCTAVIUS C. STONE.

S S *Ellengowan*, on the way to Somerset.

DR MULLENS said the London Missionary Society had now been working at the head of the Papuan Gulf for very nearly four years Until the year 1870, the coasts of New Guinea were neglected both by the English Navy and the commercial world Ships belonging to the Navy had previously surveyed certain parts of the coast, some of the islands, and the reefs in Torres Straits, and the information thus obtained had been of the greatest use in the navigation of those straits, but of the interior of the country scarcely anything was known until about five years ago When the mission of the London Missionary Society was first planned, nothing was known about the character of the people, or of the races to which they belonged Four years ago, however, Mr Murray, a South Sea missionary of nearly forty years' standing, and Mr M'Farlane secured a very pleasant settlement for several native missionaries on the two islands of Tauan and Saibai They entered into relations with the people there, and found that they were closely connected with tribes on the mainland up one of the rivers, which they called the Katau River The missionaries proceeded there in their boats, and visited the village of Katau, and saw with interest and amazement the houses in which the Papuans were accustomed to live, the modes of dressing their hair, and other things to which Mr Stone had referred in his paper Their dealings were of a very friendly nature with the people of that village, and of a neighbouring village, Torotoram That was the beginning of their intercourse with the inhabitants of the mainland, and since that time separate stations had been established on no less than ten islands in the Papuan Gulf —immediately off the mainland—viz, Darnley Island, in the very middle of the Gulf, Murray Island, Banks Island, Jervis Island, Prince of Wales Island, and others It had been found that the inhabitants of these islands, who had evidently originally come from the mainland, had not always been treated well by the pearl-shellers, and, in fact, had become very much degraded, but the nearer the islands were to the mainland, the finer, more heroic, manly, and kind-hearted were the natives, who were suspicious of strangers, but were very industrious in cultivating the soil

The mission had been carried on with the help of the steamer *Ellengowan*, and Mr M'Farlane's suggestion, that the river which they had discovered should be called the Baxter River, in honour of the lady who had provided them with the steamer, was a very good one, notwithstanding the fact that the river had already a native name, the Mai-Kassa The immediate cause of the expedition which Mr Stone had described was this Mr. M'Farlane had endeavoured to extend the mission from the two islands of Tauan and Saibai and the village of Katau towards the west, about sixteen miles to the westward there was the island of Boigu After making due preparation, Mr Macfarlane took some of his most experienced men to form a settlement there. It happened that the inhabitants were connected with the people of Tauan and Saibai, and in this way the missionaries were enabled to extend their social relations with the different tribes, and it was hoped that they would steadily make their way into the interior The people of Boigu gave Mr M'Farlane and his men a hearty welcome, and told him of the mouth of a river coming down to the coast of the mainland, at a distance of four miles from the north coast of their island Before Mr M'Farlane left to return to Cape York, he said to the teachers whom he was going to leave on the island, "When you have got your houses in order, take the boat over and see what you can make of that river." This set them on the alert, and on his return to the island he found that they had crossed, and proceeded fourteen miles up the river They informed him that they had seen the dugongs playing in the water, and they begged him to bring over the steamer, because the river was quite large enough to admit it Mr. M'Farlane became greatly interested in the matter He found Mr. Stone at Cape York, who was very anxious to accompany him; that was easily arranged; so that there were four Englishmen and six or seven natives in the expedition—Mr. M'Farlane, Mr Stone, the captain of the steamer (Mr. Runcie), and Mr Smithurst, the engineer. In one of his letters, dated May 12, 1875, Mr. M'Farlane had given an interesting account of the Boigu people Speaking of the village on the north side of the island he said:—

"The villages on the north of Boigu consist of a few miserable sheds, merely the roofs of houses. The natives, it appears, had abandoned the village and that part of the island, owing to attacks from their enemies, who cross over from the mainland They are now, however, on friendly terms with the neighbouring tribes, and have only some unknown tribes away to the westward to fear Their last battle with the savages is worthy of record, since it not only evinces their bravery, but gives evidence of a maritime spirit which Englishmen know how to admire At first their enemies fell upon them at night unawares, last time, the Boiguans saw them coming, and considering their canoes superior to those of their enemies, determined to go out to sea and give them battle there We may imagine the feelings with which the women and their daughters beheld their husbands, sons, and betrothed—all who could draw a bow or wield a club—leave the island to defend their families and homes They knew but too well what to expect in case of defeat Even should they conquer, who would fall? Doubtless they were unusually earnest in their incantations and prayers to their 'dumb idols,' and anxiously watched the combat The Boiguans took as many stones as they could conveniently carry in their canoes with their weapons, and hastened out to meet the enemy (they must have had a pretty good fleet, judging from the fifteen canoes which soon made their appearance after our arrival), who were approaching in canoes too numerous for them to number—one party as anxious to get away from the land as the other was to approach it First, showers of arrows, then spears, then crash! the canoes meet, the stones are hurled, a brief struggle, and the victory is won! Some of the enemies' canoes have sunk, and the rest are in rapid retreat

"The enemies whom the Boiguans most dread, however, are a tribe of notorious cannibals on a point of the mainland about six miles distant, whom they describe as being exceedingly fierce and cruel, who make raids upon the neighbouring tribes in order to obtain human flesh, and keep their victims alive as long as they can in order to preserve the meat, taking a limb as they want it! This is horrible I have not heard of anything like it in the South Seas"

With regard to the ascent of the Mai-Kassa, Dr Mullens begged to read the following extracts from a letter of Mr M'Farlane —

"After entering the river on the following day, we went about 20 miles further up, and came to a place where the river branched off in two different directions as before we anchored in the middle where the three arms meet, and determined to survey in the boat before we took the steamer any further, as the river was becoming too narrow for turning safely Up to this point, a distance of about 63 miles from the mouth of the river, a steamer of 500 tons burden may go with perfect safety We then commenced surveying with our small two-oared boat Found one of the arms stretching away to the west, bearing a little southerly, and narrowing rapidly, which led us to determine to proceed up the other

"Leaving the engineer in charge of the wood-cutting, we started early in the morning From the first junction the salinometer indicated that the water was becoming gradually fresher At the second junction, where the *Ellengowan* lay at anchor, the water had lost exactly half its saltness Seven miles further it was quite fresh, and the country began to look quite different. The banks became lined with palms, the trees were larger and very much higher, and covered with creepers, the air was filled with sweet odours, and the forest with the notes of birds

"Before leaving, we all went on shore, faced a large prominent tree on the bank of the river, and with our stencil plate painted, '*Ellengowan*, London,' with the date, on the tree We then took a portrait of Her Majesty the Queen, cut out a frame about an inch deep in the tree, and inserted the carte, which can be seen from the river, suspended an axe, a clasp-knife, and a looking-glass, to show our friendly feeling to any natives passing that way, and then fired a royal salute, and gave three hearty British cheers, which made the forest ring Our native crew and teachers entered with spirit into the ceremony, and the whole thing reminded us of happy loyal meetings in the dear old country far away."

Previously to Mr M'Farlane's visit no one had penetrated the interior of New Guinea in this part, though the Fly River had been visited and ascended for about fifteen miles Those who had gone up it at all had seen many natives, and met with a cordial hospitality from them He hoped that in due time the *Ellengowan* would make its way to the Fly River and gain some knowledge of the country there All along the coast of New Guinea there was an immense amount of swamp and mangrove Many of the islands were not formed of ordinary clay soil or common earth, some of them immediately opposite the coast were very rocky Boigu had not much rock, but the island of Tauan was very rocky, being nearly 2000 feet high The crest of the island was about the centre, and the slope was gradual towards the sea-shore It was covered with immense blocks of sandstone which took all sorts of shapes, forming great arches, great windows, mighty pillars, there being on the tops of some of the pillars long slabs looking like cornices, and so exactly placed that they almost appeared to have been put there by the hand of man Jervis Island, to the south of Tauan, was also rocky, and Yule Island was 800 feet high Darnley Island, in the very middle of the gulf, was also rocky. Other islands were mere sandbanks. Warrior Island was a mass of sand enclosed within the coral reefs

It appeared to him (Dr. Mullens), from the immense extent of the coral reefs spreading in all directions all over the gulf, that the land had been settled for a very long period, and the coral insects had been allowed to work in an almost uninterrupted fashion for a great length of time The coast of New Guinea itself was flat There was only one hill between the mouth of the Katau River and the mouth of the Baxter All the rivers had bars, their mouths being blocked up by the silt that was continually washed down and could not get away because of the swirling tides It appeared to him that, as on the coast of Madagascar, the accumulations of sandy material during many ages on the leeward side of the south-east trade-wind had retained the water, and the growth of the mangroves had tended in the same direction. All this, of course, made the place exceedingly unhealthy It was clear from Mr Stone's account that the Baxter River was not a part of the Fly River It had been supposed that many of the rivers would turn out to be simply portions of the Fly, but the Baxter had evidently an independent origin in some of the fountains near the highest spot which Mr Stone had reached The river there had narrowed to ten yards wide and two fathoms deep, and he was of opinion that they were then near some very high land, clay banks, or otherwise, from which the river took its rise. He did not think that Mr Stone's supposition that it extended another hundred miles inland was probable, because at the point which the explorers reached the stream was so small. The Fly River probably turned much more to the north and approached the backbone of the island, of which, hitherto, nothing was known. Navigators had seen the mountains far away, but no one had been able to visit them. As the London Missionary Society obtained further information with regard to New Guinea, it would regard it as a matter of course that they should make the

Fellows of the Society acquainted with it. On the eastern side of the gulf there was a second series of missionary stations On Yule Island the Italian naturalist, Senor D'Albertis, was living. He paid visits to the mainland, and had found his way to a small extent up a river Thirty or forty villages had been discovered in the immediate neighbourhood of that island, and the missionaries were on very friendly terms with the population That would form a foundation for further journeys into the interior, until some traveller was able to reach the great Owen Stanley Range

Captain **Evans** (Hydrographer to the Admiralty) said he had spent the greater part of three years in the neighbourhood of New Guinea, and had visited the Fly River In the surveying ship that he was engaged in (H M S *Fly*, 1843–5), they commenced a little to the east of the Baxter River, and traced the land for nearly 100 miles round the head of the Gulf of Papua In this extent of coast there were numerous arms, 4, 3, or 2 miles wide Off the Fly River the water was fresh 10 miles from the mouth at low-water The boats attempted to ascend the Fly River, but the natives were so numerous and hostile, that they were forced to retreat They lost two boats for a considerable time on this line of coast, and were eventually obliged to send in search a cutter of some 100 tons, attached to the Survey, drawing 12 feet, that vessel reached about 10 miles up one of the rivers, while a third expedition went about 20 miles up another on the north The whole of that part of the country was one vast congeries of rivers The water was occasionally fresh 4 or 5 miles out at sea at ebb-tide, and a vessel drawing 14 feet could certainly get into the Fly River, but the difficulty would be great during the south-east monsoon Mr Macleay, of Sydney, at the commencement of the present year, left with a well-organised expedition for the express purpose of ascending the Fly River and examining that part of the head of the Gulf of Papua Mr Macleay's Report, published in Sydney, had just arrived, and it was curious to notice how the want of success was caused by the season of the year at which they went His expedition spent a considerable time near the Katau River Then finding that the sea was very heavy, they decided upon waiting in Torres Straits until the weather abated. After some time, as there did not seem to be any likelihood of improvement, they proceeded to Yule Island, and with the naturalists there explored the country in a small way The captain of the vessel finally decided that it was too hazardous to attempt to ascend the Fly River, and therefore that stream and the other gigantic openings into the interior still remained unvisited All who had visited that particular part of New Guinea,—from which alone the interior could probably be reached,— must have been impressed by the large population residing on the banks of the rivers, the Baxter River, in comparison, appeared to be scarcely more than a desert

Mr **Nicholls** said he had sailed along the coast to the westward of the Island of Boigu, nearly to 140° E The shore resembled, in many respects, the coast of Australia adjacent to the Gulf of Carpentaria, consisting mainly of mangrove-swamps, which appeared to have been formed by the alluvial deposits brought down from the interior mountain-ranges. With regard to the climate, it was only reasonable to imagine that the great heat of the sun, acting upon the low swampy country, would produce an atmosphere pregnant with malaria, but that was no reason why the whole island should be considered unhealthy In such a country, with high table-lands and mountain-ranges, large rivers, and spacious bays, there must be a great diversity of climate He believed the south-eastern and eastern side of the island better adapted to a settlement than any other part, as those districts were more immediately under the influence of the south-east trade-winds The native race had been represented as very bloodthirsty. No doubt they were warlike and difficult to approach, but he thought the impression which appeared to be gaining ground about their cannibalism was rather exaggerated He had travelled through the principal islands of the South Seas, New Hebrides, Banks Islands, Santa Cruz, and the Solomon Islands, but although many of the natives had cannibal propensities, they always led him to suppose that the love of human flesh only extended to their enemies, probably on the principle that "Revenge is sweet" He did not think any race of people were deliberate cannibals, destroying white people for the mere love of their flesh He had landed in New Guinea in 9° 15′ 30″ S lat, and 141° 9′ 20″ E long, upon a sand-spit After following its course for about two miles and a half, he found that it ended in a raised plateau which was densely wooded, many of the trees resembling the cabbage-palm of Australia There was a village there, the natives of which received him in a friendly way, and gave him plenty of provisions—coco-nuts and yams Their arms consisted of bows, spears, and poisoned arrows Great taste was displayed in the manufacture of the arms Their war-clubs had at the head a round stone, which passed through the shaft They also used a very sharp axe made of stone Probably with these hatchets the natives had done the work which had led Mr Stone to imagine they must have European axes The kangaroo spoken of was the tree-kangaroo, and, unlike the Australian animal, possessed the power of ascending trees Mr Stone supposed that the absence of cultivation accounted for the liking of the people for human flesh, but it was the practice of the Papuan race to cultivate the land, and in some places fences, similar to that described by Mr Stone, were built, to keep the wild pigs and other animals from destroying the young crops He had seen these fences in nearly all the islands of the South Seas which he had visited

Mr BARRINGTON D'ALMEIDA did not think the swamps on the coast were caused by the alluvial deposits brought down from the interior On the coast of Java there were no rivers of any magnitude to bring down the deposits, and yet similar swamps existed He rather ascribed them to the comparative stillness of the Banda Sea, where the action of the wind was not so great as on the east side of New Guinea and the west side of Java On the north-east of New Guinea, where the land was exposed to the bracing action of the sea and wind, the coast was rocky and hard. The same state of things prevailed on the west side of Java, where it faced the Indian Ocean

The PRESIDENT, in conclusion, said New Guinea offered one of the most promising fields at present open to the explorer, and he would recommend any traveller animated by a spirit of research to try his hand on that island—the central interior of which was still an absolute *terra incognita* He understood that Mr Stone, who was a Fellow of the Society, was visiting that part of the world for the express purpose of geographical discovery and scientific research, and he gathered from the paper just read that that was but an earnest of future communications. He was therefore sure that the Meeting would empower him to thank Mr Stone for the interesting letter they had received from him They were also indebted to Dr. Mullens for his lucid statement, and wished all possible success to the Society which he represented, and which had been the pioneer of discovery on the southern coast So far as the authority of the Society extended, the name of Baxter River would willingly be adopted, in commemoration of the noble-minded liberality of Miss Baxter, of Dundee

2.—*Journey from Antananarivo to Mojunga.* By J. Howard Maynard.

Before I left the capital, the only route to the North-west Coast that had been traversed by a European lay through Antsianaka, due north for some distance, and occupying three weeks. I heard of a much nearer way; but so little was known about it, even by the natives, that I find it spoken of in the following terms in a letter, written home at the time of my leaving by one of the residents in the capital:—"The road to Mojunga is very little known or frequented yet; it passes through districts peopled by hostile tribes, and worse than that, through fever-swamps innumerable. There will be but bad sleeping-accommodation, for the most part in tents or in the open air."

But, whatever the difficulties, I determined to travel to Mojunga by this route, and so prove the truth or falsehood of the various reports; and in view of the mail-steamers calling at the West Coast, to find out the practical value of the route as a means of communication with Antananarivo.

I found two men who knew the road. These I engaged as guides and bearers. I had to provide sufficient food for myself for the journey, as rice and fowls are the only things to be obtained on the road.

On Tuesday, the 31st of March, 1874, I set out on my journey. For a short distance after leaving the city the road lay along an artificial embankment between the River Ikiopa and the rice-plains; then branching off, it led through mud-villages, surrounded with low mud-walls and fields of manioc and sweet potatoes. In three hours we reached Fiakarana, a village of mud-huts, where we passed the night.

On Wednesday morning, by half-past five o'clock, we were again on the road, after having breakfasted before we left the village. We crossed a range of high, bold rugged hills, running west about 18 miles north of Antananarivo, close under a large rock, called Ankotso, and entered a country of low bare hills, with rice-fields in some of the valleys. This district is very thinly peopled. We took our mid-day meal at Andranarivo, five hours from Fiakarana. About 5 miles back we had passed a small market. It may be stated that markets are not always held in or near any village, but in the centre of a populated district. The market-places are distinguished by the ground being worn quite bare, and trodden hard. Sometimes a rough pillar of stone is raised in the centre, which can be seen from a long distance. Two hours more travelling brought us to Tsarasvatra, where we stayed the night.

On Thursday morning, at six, I started with the prospect of a fine day The track we were following ran in the centre of a broad valley, with high rounded hills on either side. The surface consists of red clay, with granite boulders and crags jutting out here and there In three hours we reached Ravanaboaka, where we rested for two hours. After this we proceeded for three and a-half hours through the same kind of country till we reached Alatsinainy Angavo. Here are three small villages close together, the largest of which does not contain a dozen houses, yet at this place each Monday is held one of the largest markets in the country. It will give some idea of the scanty population of this district when I say that I stopped at every village which I came to after this, and I do not think I saw a dozen that I did not go into between here and Mojunga.

A beautiful moon was shining on Friday morning, when I called the Captain and told him to get the men ready, and by half-past five we were again on our way over the grassy hills to Maridaza, which place we entered about 9 30 A.M I soon perceived that the people of this district were different from those I had met with previously. they were darker in colour than those living on a higher level, and they always carry one or two spears when they go about Their principal occupation is tending cattle, of which they possess large herds. Their houses, instead of being made of mud, are built with wooden frames, filled in with a small sort of bamboo that grows in the rivers, and plastered with cow-dung. The towns are defended by a thick hedge of prickly-pear, planted for a width of from six to ten yards all round, and which grows to a height of eight or ten feet. Within this is a deep and broad ditch, then another wide hedge of thorns, with another ditch and a wall. There is often one entrance only, which is defended by two or three inner gates. The inhabitants build their houses within these fortified towns, instead of having them scattered here and there over the country. My baggage-men also began to keep close to the filanjana, for the people are not at all friendly to the inhabitants of the capital, although they are nominally subject to the Hovas. After resting at Maridaza for two hours, we left and travelled till 2 30, when we came to Taifaha, where we stayed the remainder of the day, on account of the heavy rain.

On Saturday we started again by 5 30 A.M., and before long entered a valley, with a small rapid river running through it. Up this valley we travelled all day, and at ten o'clock came to Ambohinanorana, where we met some hundreds of men carrying rafia This is one of the principal native fibres, and is prepared from the leaves of the Rafia palm, and is manufactured into cloth, rope, &c. The town is pleasantly situated in the centre of the valley, at some height above the river From 12 30 we continued our journey along the bank of the river, the name of which I could not ascertain. We were very much troubled by a small fly, whose bite was so severe that it drew blood from the bearers, as well as from myself. At 4 30 P M we reached Ampotaka The name signifies "in the mud," and the town was situated near the only swamp of any size that we passed throughout the journey to Mojunga A large part of the inhabitants are soldiers, as the place is a military station of the Hovas.

On Sunday, April 5th, I left Ampotaka at six o'clock, and after four hours' travelling reached the river Maromitamoka, which is here about 30 yards wide, and took the men to the armpits in crossing The meaning of the name is "the crossing of many mosquitos," and I had a good opportunity of proving its appropriateness while resting on its bank for an hour and a-half for the mid-day meal We were much troubled by the wind all day, it being sometimes so strong that the men were unable to carry me, and I had to proceed on foot The road lay for the most part along the top of a range of hills At 1 30 we stopped for the rest of the day at Mangasoavina, where I was most hospitably received by the Hova governor, and an old Arab who was living there

On Monday we only travelled for three hours from Mangasoavina to Malatsy, the rest of the day being employed by the men in buying and husking rice

We started on Tuesday morning, at half-past five We had now two days' journey before us without a human dwelling-place near the road I saw the "Traveller's tree" for the first time during this day's journey. At 4 30, after having travelled nine hours, we camped by a small stream, where we found several men, who were going up country with salt, and had already halted, cooking their rice I passed the night in a native tent I had with me.

At 4 30 on Wednesday morning we crossed the stream and proceeded on our journey I may here mention that as all my men were strangers to this part of the country, I had great difficulty in finding out the names of the streams. We saw the River Ikiopa this day for the first time since leaving it near the capital The latter half of the day's journey was over sterile hills, with no water nor grass, and only a few stunted bushes The road and hills around are all composed of quartz. By five o'clock we were glad to enter Mavatanana, after having been nine and a-half hours on the road Mavatanana is situated on the edge of the flat district, by which I believe the island is surrounded It is a large town and a military station of the Hovas, and is built on a spur of the hills overlooking the plain, which from here appears well wooded, though really there is very little large timber We had now finished the land part of our journey, having reached the navigable part of the River Ikiopa, and I was in hopes of being able to hire a canoe and proceed the next morning I was, however, compelled to spend the whole of Thursday in this hot town, waiting for the only available large canoe, which had just come up the river laden with salt, and was not yet empty

By Friday morning it was ready, and at half-past five we embarked The canoe was about 3 feet 6 inches in width, and not less than 30 feet in length It was hollowed out of the trunk of a single tree, and carried myself, baggage, and twenty men About 5 miles below Mavatanana another large river joins the Ikiopa The river winds very much in its course, and varies in width from 30 to 100 yards, the stream running certainly not less than 5 miles an hour At about 5 30 P.M. we stopped at Karamabily, where we passed the night, after having floated down the river for 9½ hours The height of the banks prevented my getting any view of the country through which we passed The river is so full of alligators that the people are afraid to come near the banks, but when they want water, bale it out by means of a small gourd, fixed on the end of a long stick.

From Karamabily it took us fifteen hours on Saturday to reach Marovoay, which is situated on a tributary of the same name, and is of considerable trading importance The town is built in three divisions—apparently, 1st, a high hill, surrounded by stockades, and called the fort, where the Governor and Hovas live. On the low ground nearer the river is the quarter where the Arabs and Indians (principally Banyans, I believe) live, and on the opposite side of the fort are the Sakalava huts. Small dhows come up from Mojunga as far as this place, most of them bringing salt, and returning with hides and other produce collected from the interior. As the Governor asked me to dine with him on Monday, I could not leave until the Tuesday evening tide. I started about six o'clock in a small chartered dhow belonging to an Indian, who took charge of the navigation, and arrived at Mojunga at noon on Thursday, the voyage having taken 42 hours. In a dhow, properly managed by a man who understands the navigation, the time occupied should not be more than 12 hours.

Mojunga is the principal port on the West Coast now, and will eventually, I believe, be the chief port of the island It is situated near the entrance to Bembatoka Bay, a splendid natural harbour, where steamers and ships of large tonnage can anchor within a very short distance of the landing-place

The route that has been hitherto adopted in proceeding to the capital has been from Tamatave, the port on the eastern side of the island, along the coast to Andevorande, and from there, almost due west, to Antananarivo, a distance of about 200 miles altogether.

The practical question, as the trade of the island developes, is the relative value of the two roads as a means of communication with the interior

For the first 60 miles from Tamatave, as far as Andevorande, the road is good. About half this part of the journey might be done in canoes on the lakes which lie near the sea, but the inconvenience of transferring goods from one mode of conveyance to another prevents this being usually done. From Andevorande inland the road is bad It passes over very steep hills, most of which are formed of clay, through swamps and through forests, where there is always more or less rain, which often renders the path almost impassable. This route is considered unhealthy from about December to June, but there exists much difference of opinion as to the commencement and duration of the unhealthy season. The entire distance is about 200 miles

After having travelled over both roads, I consider that the Mojunga route has many advantages over that of Tamatave, the hills being less steep, and the forests and swamps avoided. The difficulty of obtaining carriers, and the reported dangers of the way, prevent its being generally used at present

The resources of this large island, which lies partly within and partly outside the tropics, have been hitherto very slightly developed. The following articles can be obtained there, to my certain knowledge India-rubber, sugar, tobacco, coffee, ginger, rafia-fibre, cotton, hemp, aloes, turmeric, silk, rice, indigo, gum-copal, beeswax, honey, hides, iron, castor-oil, neats'-foot-oil There is also good timber of various sorts, but its exportation is prohibited. It may also be added, that slaves are sold in the open market.

Fourth Meeting, 10th January, 1876.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*J. M. Stuart, Esq., Capt. Joseph Watson, Edward Bickers, Esq.*

ELECTIONS.—*Lieut.-Col. T. D. Baker*, C.B., *Capt. John P. Cheyne*, R.N., *Charles R. Congreve, Esq., George Errington, Esq.*, M.P., *Francis William Fox, Esq., Lieut. G. Huntingford*, R.N., *Henry Batson Joyner, Esq., Philip Rawson, Esq., Rev. George Townsend Warner, Archibald Roberts Young, Esq.*

DONATIONS TO THE LIBRARY FROM 13TH DECEMBER, 1875, TO 10TH JANUARY, 1876.—Parte primera de la Chronica del Peru, por Pedro de Cieça de Leon, Anvers, 1554, The Seventeen years' travels of Peter de Cieza through the mighty kingdom of Peru, 1709, Biblioteca peruana, por Manuel A. Fuentes, 3 vols., Lima, 1861, Cartas y relaciones de Hernan Cortés, por Don Pascual de Gayangos, 1866, Historia natural y moral de las Indias, por Joseph de Acosta, Madrid, 1608, The Naturall and Morall Historie of the East and West Indies . . . written in Spanish by Joseph Acosta and translated into English by E. G., 1604, A Voyage to the South-sea in the years 1712–14, by Monsieur Frezier, with a postscript by Dr. Edmund Halley, and an account of the Jesuites in Paraguay, 1717, The general History of the vast continent and islands of America, by Antonio de Herrera, translated by John Stevens, 6 vols., 1725 and 1726, Memoirs of General Miller, by John Miller, 2 vols., 1829, Descripcion del Gran Chaco, Gualamba, &c., por Pedro Lozano, Cordoba, 1733, Memorias de los Vireyes que han gobernado el Perú, 6 vols., Lima, 1859, Primera, segunda, y Tercera partes de los Veinte iun libros rituales i Monarchia Indiana, por Juan de Torquemada, 3 vols., Madrid, 1723, La Historia de D. Fernando Colón, relacion de la Vida y Hechos de el Almirante D.ⁿ Christoval Colón su padre, tradujo por Alonzo de Ulloa, Carta de relacion de las Tierras que ha descubierto en el Jucatán, 1522, Carta tercera . . . de las cosas . . . de la Ciudad de Temixtitán, 1522, and Carta quarta (containing Cartas y relaciones by Pedro de Alvarado and Diego de Godoy, 1524, Sevilla), por D. Fernando Cortes, "Breve Sumario" of the "General i Natural Historia de Indias," por Gonçalo Fernandez de Oviedo, alias de Valdès, Naufragios and Comentarios de Alvar Nuñez Cabeza de Vaca, and Examen de la narracion de Alvar Nuñez Cabeza de

Baca en las tierras de la Florida i del nuevo Mexico, por Antonio Ardoino, Madrid, 1736, Historia de las Indias, and Cronica de la Nueva-España, por Fr Lopez de Gomara [? Saragoça, 1552–53], Historia del descubrimiento del Peru, por Augustin de Zarate, Ambers, 1555, Conquista del Peru, de Francisco de Xerez [2nd part of Oviedo's 'Historia general de las Indias,' 1547], Historia de el rio de la Plata y Paraguay, por Hulderico Schmidel, Argentina (a poem), por Martin de el Barco, Madrid, 1730, Viaje del Mundo de Simon Perez de Torres, with Epitome del Viaje de algunos mercaderes de Sa Malo à Moka, 1708, por Manuel de Grova, and Historia general de las conquistas de Granada, por L F de Piedrahita, Amberes [? 1676] (*C R Markham, Esq*, C B) Parliamentary Reports on Euphrates Valley Railway, 1872, Ceylon, Paumben Ship Canal, 1872 and 1873, and Colombo Harbour, 1874, Holyhead New Harbour, 1873, Dover Harbour, 1873 Cork Harbour, 1871, Guano deposits in Peru and the islands of Lobos de Tierra, &c, 1874, Relations with Acheen, 1873, Correspondence with Russia on Central Asia, 1873, Santo Domingo, No 1, 1874, Correspondence on determination of N W Boundary between Canada and the United States, 1875, Cession of Fiji, 1875, Treaty with the King of Siam, 1874, Difficulty as to Formosa between China and Japan, 1875, and Native States in the Malay Peninsula, 1874 (*Lord Arthur Russell*, M P) Proceedings of the Royal Colonial Institute, a complete new bound series (*The Institute*) On the limits of the Yoredale series in the North of England, by G A. Lebour, 1875 (*Author*) On maps of the world, by G Darwin, 1875 (*Author*) Entwurf einer Theorie der Meeresströmungen, von Dr Gabriel Blazek, Prag, 1876 (*Author*) The wind theory of Oceanic circulation, objections examined, by J Croll, 1875 (*Author*) Mémoire sur l'origine du Gulf-stream, par F C de Graça, traduction par D Mouren, Rio de Janeiro, 1875 (*Translator*) Statistical Report on the health of the Navy for 1874 (*The Lords Commissioners of the Admiralty*) Physical Geography, by W D Cooley, 1876 (*Author*) *Collection of plates to Sonnini's Travels in Greece and Turkey, 1801 (*General Sir W Codrington*, K C B) La Patagonia, por V. G. Quesada, Buenos Aires, 1875 (*Author*). Observations météorologiques de l'Expédition arctique Suédoise, 1872–3, rédigées par A Wijkander, Stockholm, 1875 (*Dr Nordenskjold*) Victorian year-book for 1874, by H H Hayter, Melbourne, 1875 (*Author*). Victoria Statistics for 1874, Statistical Register, 1874, part 5, and sheet of Statistical tables (*The Government Statist*) South Australia Lieut Goalen's Survey of Port Adelaide, Report on the Lake Eyre Expedition, 1875, E Giles's Explorations, 1872, and

Ross's Explorations, 1874 (*The Parliamentary Librarian, Adelaide*) Forrest's Journal of Exploring Expedition, Western Australia Perth, 1875 (*J. Forrest, Esq*) Bushman Folk-lore, by the late W. H J Bleek, 1875 (*Mrs Bleek*). U.S Hydrographic Office, publication No 37, Coasts of the Mediterranean, part 1, by H H Gorringe, Washington, 1875 (*The U S Hydrographic Office, per Commodore Wyman*) El departamento de Ancacho, 1873, and El Perú, vol i, 1874, Lima, by Don Antonio Raimondi (*Author*) Handbook for travellers in Russia, &c, 3rd edit, 1875 (*J Murray, Esq*) A case containing 51 large and 50 stereoscopic views of Spitsbergen, Novaja Zemlia, &c, by Count Wilczek (*Count Wilczek*), and the current issue of publications of corresponding Societies, &c.

DONATIONS TO THE MAP-ROOM FROM 29TH NOVEMBER, 1875, TO 10TH JANUARY, 1876.—MS map of the Nile above Kerri, MS map of the Nile at Moogi, and view of the adjoining country, showing the place where M Linant de Bellefonds was killed, rough sketch-map of the Nile from Gondokoro to M'rooli, marking Colonel Gordon's stations, MS tracing of Survey of the Upper Nile from Ragaf to Laboré (*Colonel S E Gordon*) MS map of the Markassa or Baxter River, New Guinea (*Octavius C Stone, Esq*) Map of the Baxter River, New Guinea, supplement to the 'Sydney Mail,' October, 1875 (*Hon G. A Lloyd*) Chart of Prince of Wales's Group, Torres Strait (*J B Redman, Esq*) Index to Charts and Plans, published by the Hydrographic Office of the Admiralty, 16 maps, bound (*Hydrographic Office, through Captain F. J Evans*) MS. map of the South end of Zanzibar Island, MS map of route to Magila, MS map of the entrance of the River Mtangata (*Alfred Bellville, Esq*) Outline map, showing the most direct route from Gambia to Timbuctoo, MS (*H. T M Cooper, Esq*) Sketch of a reconnaissance made by M Linant de Bellefonds between Ragaf and Lake Victoria, February to June, 1875 (*General Stone, Chief Staff, Egyptian Army*). Military sketch of the Transkeian territory, South Africa (*Quartermaster-General's Department, Horse Guards*).

Lieut Cameron's Journey from Lake Tanganyika to the West Coast of Africa.

In introducing the subject of the evening, the PRESIDENT said it was his pleasing duty to congratulate the Fellows of the Society upon the results of one of the most arduous and successful journeys which had ever been performed in the interior of Africa It was a further source of congratulation that this geographical feat had been accomplished by one who was acting under the auspices of the Royal Geographical Society Lieut Cameron, in the first instance, proceeded to Africa to take charge of one of the expeditions for the search and relief of Livingstone After the great traveller's death, he undertook exploration on his own account, and the Society had already commemorated his important discovery of the outlet from Lake Tanganyika flowing apparently to the great Lualaba of Livingstone The last announcement made at a meeting of the Society with regard to Lieut Cameron, was that he had left Ujiji in May, 1874, with the view of tracing that outlet to the Lualaba and following this latter river, supposing it to be the Congo, to the western coast In his anniversary address last May, he (the President) said, "There is no concealing the fact that this projected journey of Lieutenant Cameron's, on which he has entered with little preparation, impelled by an ardent desire for geographical discovery, is one of extreme danger If he should indeed succeed, single-handed as he is, in crossing the African continent from the forests of Manyema to the mouth of the Congo, through an unknown country and beset with wild and hostile tribes, he will have achieved a feat unparalleled in the annals of geographical discovery, and will take his place in the very first rank of African explorers" Cameron had not carried out that programme in its entirety, he had not followed the Lualaba down to the mouth of the Congo, but he had fairly crossed the continent from the eastern to the western coast, and in doing so had traversed 1200 miles of country entirely new to us Further, by a series of most extensive and elaborate observations, he had laid down for the first time a sound geographical basis for future exploration Up to the present time, geographers had been dependent for their knowledge of the geographical positions of places in that part of central Africa upon one single lunar observation taken at Ujiji, but Cameron had now registered nearly 400 lunar observations, verifying positions sometimes by as many as 160 in one spot He had addressed a letter to the President of the Society, and another to the Secretary, both of which would be read that evening. He had also sent home an instalment of his maps and observations, those received at present extending as far as Lunga Mandi's

The following letters were then read —

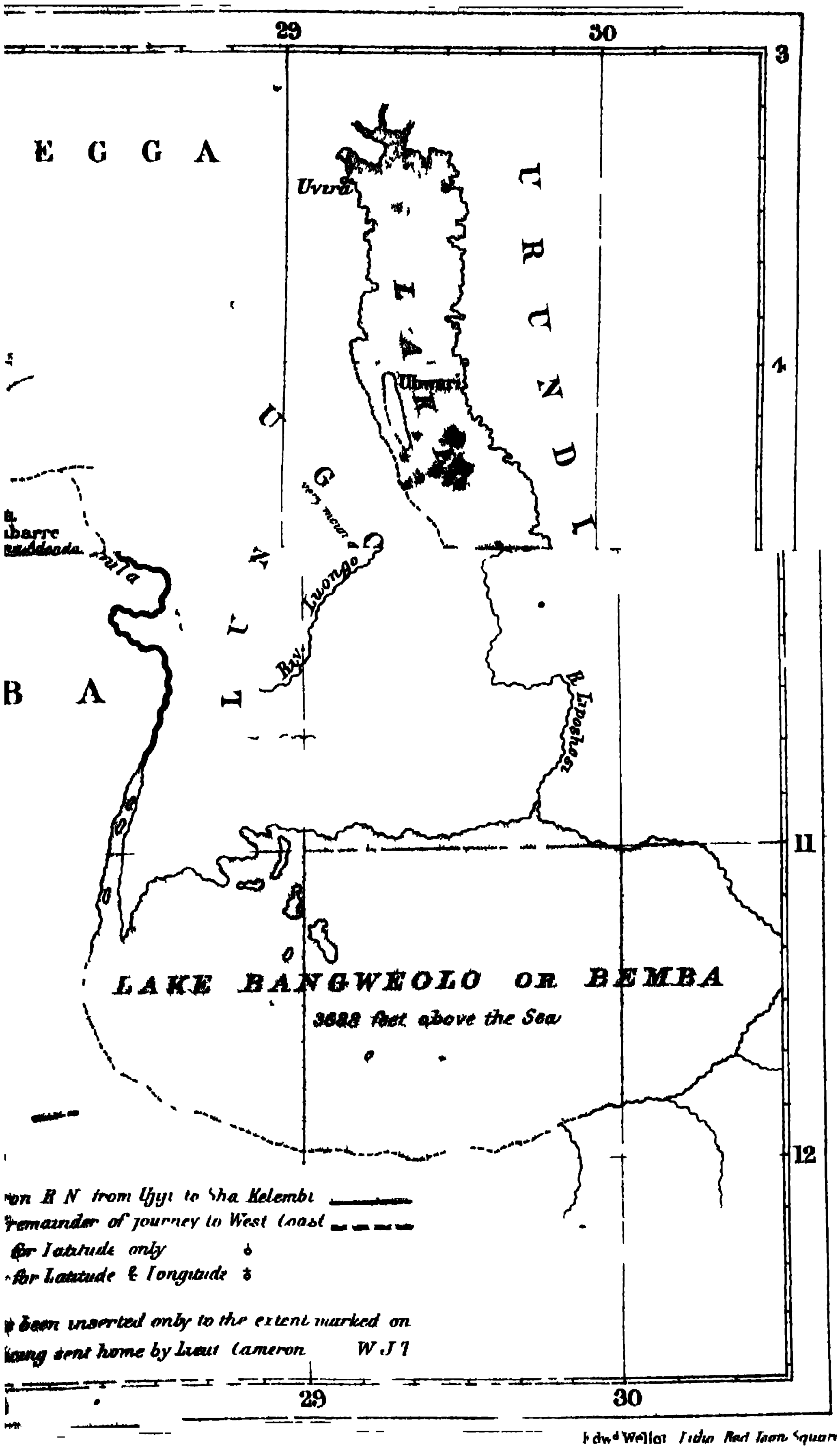
1. *To* Major-General SIR H C. RAWLINSON, K C B, &c, *President of the Royal Geographical Society*

[EXTRACTS]

British Consulate, Loanda,
November 22nd, 1875.

MY DEAR SIR,

I have the honour to report the safe arrival of the Livingstone East Coast Expedition at the West Coast. Letters which I wrote and forwarded long ago, and overtook again, accompany this, and also a tracing of part of my route, some sections and miscellaneous papers which I made out in the interior. I am not able to write much now as I am only recovering from an attack of scurvy, which came on the day I reached the coast at Katombela, or Catumbella according to Portuguese. My thermometers are all right; of course they must be re-tested at Kew when I return. I must stop here till it is warmer weather in England, as, though I want much to revisit the dear old mother country, it is no use for the sake of a month or two risking being ill again. The interior is



Edwd Weller Litho Red Lion Square

mostly a magnificent and *healthy* country of unspeakable richness. I have a small specimen of good coal; other minerals, such as gold, copper, iron, and silver are abundant, and I am confident that with a wise and liberal (not lavish) expenditure of capital, one of the greatest systems of inland navigation in the world might be utilised, and in from thirty to thirty-six months begin to repay any enterprising capitalists that might take the matter in hand I am not able to write much now, but whilst I am here intend to work, and therefore keep my journals, sketches, &c, so that when I return to England the work will be in a forward state

I have two private letters here which say that the Society had declared its willingness to be answerable for the expenses incurred and to be incurred by the Expedition, and that a fund had been raised by subscription on my behalf, or rather, on behalf of the Expedition. I risked everything, put all down on the turn of the die I said the British public and the Society will never desert any one who tries to do his best, and I am proud and happy to think that my confidence has not been misplaced, and that, beginning with Her Most Gracious Majesty, all England has taken an interest in the work to which I hope to devote my life On another Expedition I should be able to carry out with twice the comfort and half the expenditure of this one. *Nutmegs, *coffee, *semsem, *groundnuts, *oil-palms, the **mpafu* (an oil-producing tree), *rice, wheat, cotton, all the productions of Southern Europe *India-rubber, *copal, and *sugar-cane are the vegetable productions which may be made profitable, those marked with an (*) exist there now, and wheat is cultivated successfully by the Arabs as well as onions, and fruit trees brought from the coast. A canal of from 20 to 30 miles across a flat level country would connect the two great systems of the Congo and the Zambesi, water in the rains even now forming a connecting link between them. With a capital of from 1,000,000*l.* to 2,000,000*l.* to begin with, a great company would have Africa open as I say in about three years, if properly worked. What the diplomatic difficulties might be I of course cannot say, but I expect they would be far greater than the physical ones

I remain, dear Sir,
Yours truly,
V. LOVETT CAMERON.

2. *To the Secretary of the Royal Geographical Society.*

Sha Kelembe, on River Lumeji, Lovale,
Lat. 11° 31′ S., Long. 20° 24′ E.,
7th September, 1875.

DEAR SIR,

I have to request that you will report to the President and Fellows of the Royal Geographical Society the near approach of the expedition under my command to the West Coast.

It is not possible for me now to enter into details of the work done; but although it comes far short of what I hoped to have done, and what I might have done if I had a pluckier set of men, I hope that on my arrival in England it will be found that I have done a fair amount towards clearing up the mist that overhangs African Geography, and also to warrant the large but unavoidable expenditure. I suppose you have long ago received my maps and letters from Ujiji, so now will give a cursory statement of my work since then.

First, from Ujiji I went to Nyangwe, by what I suppose was nearly the same route as that which Dr. Livingstone followed. I found that he had placed Nyangwe 90 miles too far to the west, and that thence the Lualaba, far from leaving its westing and turning to the north, really leaves its northing and turns to the west. Further down in its course it was reported to flow W.S.W. Some of the Arabs had been far away to the N.N.E., into Ulegga, and had heard of Egyptian traders from the natives, but had heard nothing of the Albert Nyanza, though some of them knew of it when I asked about it from previous journeys to Karagué, &c. I am disposed to think that it is much smaller than it is drawn by Sir Samuel Baker.

A river, said to be as large as the Lualaba at Nyangwe, joins it a short way further down from the northward, besides other important rivers from the northward; possibly this river (the Lowa) may be the lower course of the Buri. The Lualaba at Nyangwe is only 1400 feet above sea, or 500 below the Nile at Gondokoro, and lies in the centre of an enormously wide valley, which receives the drainage of all this part of Africa, and is the continuation of the valleys of the Luapula and Lualaba.

I tried hard to get canoes at Nyangwe, but without avail. I believe much of the trouble arose from my own people, who were thoroughly funked by the stories of the Arabs and Wamerima there; and after some time spent in vain attempts to get boats, I went with Hamèd ibn Hamed (alias Tipo tipo), who had come to Nyangwe from his permanent camp to settle a war between the

Nyangwe traders and Russûna (a chief, who was a friend of his), to his camp to try and work my way from there to a lake, Sankorra, of which I had also heard at Nyangwe, into which the Lualaba falls, to which trouser-wearing traders are reported to come in large sailing-boats, to buy palm-oil and dust packed in quills—which may be gold-dust

However, when I arrived at Tipo tipo's camp, the chief on the other bank of the Lomami, to whom I sent to ask leave to cross his territories (as he had not previously allowed Tipo tipo to go into his country), refused me a passage, saying, that if I came there he would make war against me. Finding this road blocked, I set off to the southward with three Warua guides, given me by Tipo tipo, for Kasongo's (who is the big chief of all Urua, and to whose town Portuguese traders were reported to come), in the hopes of being able to make a road from there to the lake When I arrived at Kasongo's (Kilemba?) I found there an Arab, Jumah ibn Salim (Jumah Merikani), who was most kind and hospitable to me, and a black trader hailing from Bihè, called Jose Antonio Alviz, who said, when I first arrived, that he wanted to start in fourteen or fifteen days, but that some of his men were away with Kasongo making war, and that, as I wanted to go and see some lakes near, he would wait a month I set off then, and visited Mōhrya, a small lake which is fed by the rains, and is apparently isolated from the rest of the water-system, receiving only the drainage of a small basin, and sending out no river but which is interesting, as there are regular lake-villages (like those in Realmah) on it. On my return from Mōhrya, Alviz said he was still waiting for Kasongo, so I set off to try and reach Kassali (or Kikonja) and Kowamba, two lakes on the true Lualaba, but I was not allowed to cross the Lovoi, and had to be contented with a distant view of the Kassali

On my return I found that Kasongo had been and gone away again, but had left orders for people to go to him when I arrived, as he said he wanted to see me. Alviz I found with all his loads packed, and he said he was only waiting for the return of Kasongo to start at once, saying, that when Kasongo arrived, two or three days would be required to take leave of him, and then he was going to Bihè as fast as possible, as he was short of stores He first of all said he did not want to make any agreement with me, as he was the same as an European, and that whatever he said was true, although in the sequel I found him to be the most persistent and causeless teller of falsehoods that it has ever been my luck to come across.

After about six weeks, Kasongo made his appearance, and then Senhor Alviz said he wanted a written agreement as to what he was to be paid, and I had to enter into a contract to pay him $400 on my arrival at Loanda, expressly stipulating, however, that there were to be no delays on the road for the purposes of trade or otherwise, and which clause I was very particular in having explained to him, when he said how could any delays arise, and giving sixty-eight days' marching as the number that would be required to reach Benguela, saying, that he marched every day till 3 or 4 in the afternoon, and halted once in twelve or fourteen days to buy food I made this agreement out in triplicate, one copy I left, with other letters for Zanzibar, in the hands of Jumah ibn Salim, one I kept, and the third I gave to Alviz

A few days after, I heard that Alviz had agreed to build a house for Kasongo, and when I went to complain of this as a breach of faith, he denied it, however, in a few days he said that the leading man of his (a mulatto, and son of Major Coimbra, of Bihè) was going to a place two or three days in front to build a house for Kasongo, but that it was only the work of three or four days, adding that his own house, on the model of which it was to be built, was finished in four days

After another delay Coimbra came back again, having been to an entirely different place, the story of his having been about the house being a gratuitous falsehood, and then I was told that the whole caravan would go and build the house, passing it on their road. I tried very hard to get men or guns and powder to try and make the road to Lake Sankorra, but Kasongo refused to allow me to go there, and the road was reported by people who had been that way to be impassable in the rainy season, so I had to put up with the delay about the house Just before I left Jumah ibn Salim's, I heard that a party belonging to Alviz was away at a place called Kanyōka, and had been there for nine months, and that Alviz was going to wait for them At first he denied this, but of course it proved true in the long run

We left Jumah ibn Salim's in the end of February, and then made a dawdling march to Totèla, where the house was to be built, making five camps and halting three or four days on the road, whilst by men with loads the distance might be done in two days, and men with only guns constantly went from one place to the other in one day

Arrived at Totèla, some people were sent off to Kanyōka, and I was told they should be back in twelve or fourteen days. The house was built, but a very large proportion of the work had to be done by my people, and it took about twenty days, at the end of which there was still no news about the Kanyōka people. I tried to get Kasongo to give me canoes to go down the Lomami to the Lualaba again, but he said there were two roads by which I could go, viz, either go with Alviz, or go and stop with Jumah Merikani till he left

After all, the Kanyōka people did not turn up till the end of May, and in the meantime Alviz allowed Coimbra (or Kwarumba, as he is called up here, and who is a choice specimen of an unmitigated ruffian) to go away on a plundering expedition with Kasongo to get slaves, protesting, however, that he would not wait for him if he was not back when the Kanyōka people returned When the Kanyōka people came in, there was a short delay to wait for Kasongo, who came back a few days after they arrived, leaving Kwarumba behind him

During this delay one of my men managed to set fire to the camp and burnt down all our portion of it, and a few huts belonging to Alviz people Luckily I saved all my maps and journals, though it was touch and go.

The people belonging to Alviz whose huts were burnt put in most ridiculous claims for things averred to be lost, but which mostly had no existence I said to Alviz that I was willing to pay for what had actually been lost, but that I did not see the force of paying for things which never had any existence He said that the people must be paid, or they would steal his ivory when he arrived at Bihè. I said he could pay them, but I would protest against the claim at Loanda He also refused to have any restitution made for things stolen from my men and me in the confusion After this we started for Lunga Mandi's, a sub-chief of Kasongo's, which we reached in ten days, and then I was told we were to wait for three days to buy food to cross Ussambi. On the third day a small caravan arrived, under the charge of a slave of a white man living at Dondo, near Loanda, and another day was to be allowed for them to get food On the evening of the fourth day I asked if all was right for starting in the morning, and was told that it was. However, about 7 or 8 P.M. I was told that people were behind at Totèla, and that Alviz would not start without them I made a fuss, and people were sent back to hurry them up Whilst we were waiting for these people I got hold of Bastian, the slave in charge of the Dondo caravan, and he offered to show me the road there, and said Alviz had prevented his coming to do so at Totèla or Jumah Merikani's, but he said now he would wait a few days to see if Alviz would start or not. After eighteen days at Lunga Mandi's, by dint of putting the screw on sharp, we made a move, but at the first camp some slaves ran, and we were detained a day whilst their owners went to look for them, and then on the next morning I was told news had come from Kwarumba during the night that he would arrive in the course of the day, and that we should wait for him. Kwarumba turned up that day with a string of forty or fifty wretched women, who he had collected from different villages which he had destroyed, in company with Kasongo Since then we have travelled fairly, with occasional halts, to look for runaway slaves, to buy food, and for Alviz to trade. Alviz, although he protested to the last to me that he was not waiting for Kwarumba, but for some other people whose friends refused to start without them, claimed slaves from Kwarumba to pay for his detention

I shall put the whole question of Alviz's claims on me in the hands of Her Majesty's Consul at Loanda, and of the Portuguese Governor there, and be guided by their decision.

We ought to reach Benguela about the middle of October, and if all goes well, I should be in England by Christmas.

Now for the geographical portion of the subject, which at present I am only able to give a sketch of, and which, therefore, remains till my arrival in England to be fully related.

From Nyangwe to Kasongo's my route was principally up the eastern side of the valley of the Lomame, which is a minor valley in the great one of the Lualaba.

The Lomame has no connection with the Kassabé, as shown in the map published by Keith Johnston, but is a separate and independent stream It receives many brooks from the eastward, but no large rivers on that side, on the west it receives the Luwembi, coming from a lake called Iki, which is probably the Lake Lincoln of Livingstone, which receives the Lubiranzi and Luwembi, both considerable rivers

The Lualaba mentioned as such by the Pombeiros is the true Lualaba, and the position of its sources as laid down from their route may be taken as fairly correct. It then runs N N E. through two large lakes, the Lohemba and Kassali, and in a third, of smaller size, called Kowamba, receives the Lufira from S S E.* Between Lufira and true Lualaba lies Katanga, a district rich in copper and gold, and with a marvellous abundance of game, if all reports be correct. A short way above the junction of Lualaba and Lufira are two other lakes, Kattara and Kimwèra, but their connection and position with regard to the rest of the water-system I have not been able to make out very clearly, but I believe Kattara to be to the west of the Lufira, and Kimwèra to be between it and the Lualaba.

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* It will be seen that Lieut Cameron, in his map, makes the Lufira flow into the Kassali —[ED]

Above Lake Kassali, the Lualaba receives the Luburi, or Luwuli, and Lufupa, and the Lovoi falls into the lower end of Kassali. Below Kowamba the united rivers, now known indifferently as Kamorondo and Lualaba, flow through a chain of small lakes, commencing from south, Kahanda, Ahimbè, Bembè, and Ziwambo, and is then joined by the Lualaba of Livingstone, which is properly called the Luvwa, but the Arabs usually call it the Lualaba; below their junction the united rivers flow through Lake Lanji (the Ulenge of Livingstone), and on past Nyangwe, where the name of Lualaba is corrupted into Ugarrowwa by the Arabs.

The Kamorondo receives from the east, commencing from south, the Kalamè hongo (probably the Cavulancango of the Pombeiros), Mana, Mkotwè, Kasamba, and Kisuvulungo; and from the west, Luvijo, Kuvoi, Losanzi, and Luvunguwi, all considerable streams.

Below the junction of the Luvwa and Kamorondo, the following streams fall into the Lualaba before reaching Lake Lanji, from the east, the Lumbu, probably the river passed by me as the Luwika on my road to Nyángwe, above their junction the Liambanji and Lukuga, the latter from Lake Tanganyika.

Below Lake Lanji the Lualaba receives from the east the Luama and Lulindi, besides many minor streams. Beyond Nyangwe from the north, the Lila, the Lindi, and the Lowa, the last is said to be as large as the Lualaba at Nyangwe, and to receive two large streams, both called Lulu.

Between Nyangwe and Lomami, the Luvubu and Luwik, or Kasuku, fall into the main stream from the south. Beyond the Lubiranzi, two large rivers, the Luilhu and Buzimâni, flow north into Lake Sankorra.

Since leaving Kasongo's, we have crossed the Lovoi, the sources of the Lomami, the Luwembi, in long. 23° 20′ the Lukoji (or Lukojo), in 23° 10′ the Luwati, both large streams falling into the Lulua, whose sources we passed in long. 23°, close to the sources of the Lulua we came upon water going to the second African river, the Zambezi, whose sources may be placed in 23° E. long., and 11° 15′ S. lat., the Lulua rising in 23° E., and 11° S. Since then we have come across a great table-land with numerous streams, some going to Kassabe, and some to the Liambai, or Liambeji, as it is also called by the natives.

We have now for three marches been following the left bank of the Lumèji, and have just come off the great plains. The Lumèji is a very considerable stream, and an affluent of the Loèna, the source of which I hope to pass in front, and which falls into the Liambai.

The Kassabè has been at a distance of from 7 or 8 to 20 miles to the north of us for the last eleven marches, during which we have maintained a generally westerly direction, the Kassabè commences its northing in about 22° E., running up between the frontiers of Lovâle and Ulûnda.

I can scarcely trust to myself to try and clear up the confusion of names arising from the frantic distortion and mutilation of native names by the half-caste Portuguese traders, but think it best to leave it till my arrival in England However, I may say that Luvar of the Portuguese is our Urua, and the Urua of the natives also. Lovalè is an entirely different country, lying between 20° and 22° east longitude, peopled by a different race, speaking a very distinctly different language.

I can hear nothing of the Mosshamba Mountains, though I have asked repeatedly about them, but am always told that there are no real hills this side of the Kwanza (or Coanza), though the Kassabè in the middle part of its course flows through a moderately hilly country. I leave this now to be finished at our next halt, from whence Alviz is going to send men on in front.

September 17th, 1875
Chikumbis, near Peho, country of Kebokwè

Since writing the above we have made five more marches, leaving Sha Kelembè's on the 10th instant, and making rather a round on our way. We passed two streams going north to the Kassabè, but the tracing of my route up to this will show better than I can write all we have seen. We have now just come into a hilly country, though before, since leaving Sha Kelembè's, we had risen considerably, although to the eye the country seemed to maintain the same level.

I hear that there are disturbances between Bihè and the coast, but all the native stories are so vague, and usually so false, that I do not know what to believe. One story asserts that a party with 6000 guns was turned back and robbed by the Balunda, but 6000 guns leaving such a place as Benguela is false on the face of it, and equally false is the power of any nation on this line in Africa to defeat such a body. To add to the improbability, a white trader is said to have fought his way through safely from Benguela to Bihè, the most probable foundation of the story being that some natives tried to steal from him at night, and that one or two were shot, if there be any foundation at all.

Of course at present I cannot tell how this will affect my future movements, but the Balunda are said to be on the road to Loanda, as well as on that to Benguela, perhaps I may have to make a round to get to Loanda, but I expect to find the direct road open to Benguela, as there must be a road for trade, and the people of Bihè make caravans on their own account to trade up here for bees-wax, and they must find a market to sell this, or their trade would come to a dead-lock, and the only market they know is Benguela.

I have the honour to be, Sir,
Your most obedient servant,
V. LOVETT CAMERON, Lieut. R N,
Commanding Livingstone East Coast Expedition

P S.—I don't expect to be at Benguela before the end of October, and I hope you will be kind enough to move the Lords Commissioners of the Admiralty to extend my leave, which now expires about the middle of November, to the end of the year, or further if necessary.

The PRESIDENT then made the following comments on the letters, in which he was aided, he said, by some geographical notes, which Mr. Keith Johnston had placed in his hands

From Lake Tanganyika to Nyangwe, Cameron followed very nearly the same route as Dr Livingstone, and the accounts of the geography of this line given by each traveller, agree well in their main features Although Lieut. Cameron did not follow the Lukuga down to its junction with the Lualaba yet he casually mentions in his letter the fact of its joining that river, so that his previous supposition, so far, was confirmed

Cameron notes that Livingstone was in error 90 miles in his longitude of Nyangwe, but this alludes to the earlier position assigned to that town In his letters from Ujiji in November 1871, Livingstone says, "if Speke's longitude of Ujiji is correct, and my reckoning of Lualaba is not very far wrong, the great river is some 5° west of Tanganyika, or in 24° or 25°" The reduction of Livingstone's routes in the map published with his 'Last Journals,' however, brings Nyangwe into 26° E, or only 30′ west of the true longitude 26° 30′, as determined by Cameron

The most important points in Cameron's work at Nyangwe are perhaps the evidences he gives of the identity of the Lualaba and Congo These, indeed, are almost conclusive, notwithstanding the failure of the traveller to follow the course of the river Livingstone shows the Lualaba below Nyangwe turning to the north, and in his diary ('Livingstone's Last Journals,' vol ii. p 111) describes it as having "a current of 2 miles an hour away to the north," but Cameron, on the other hand, indicates the course of the Lualaba below Nyangwe as W N W, and learns that further down its course is W.S W He finds also that the elevation of Nyangwe above the level of the sea, instead of being 2000 feet as Livingstone believed, is 1400 feet. This precludes all possibility of a union between the Lualaba and the Nile, for the Great Nile lakes lie at elevations exceeding 2500 feet, and Gondokoro, below which the limit of the Nile basin has been clearly defined on the west by Schweinfurth and others, is upwards of 1500 feet above the sea. Lieut. Baker's observations give a mean of 1525 feet, Colonel Gordon makes it 1621 feet, and Apuddo, a station above the rapids, and about half-way between Gondokoro and the Albert Nyanza, 2204 feet

There is, besides, the evidence gathered by Cameron at Ujiji, in May 1874, where one of the Arabs informed him that "he had been fifty-five days down the river from Nyangwe, and had arrived at the sea where ships came, and white men had large houses, and traded in palm-oil and ivory," "that the Ugarowwa (Lualaba), was called the Congo, was very large, in many places as wide as the Tanganyika, and had many islands in it" He also mentioned that he heard of traders from the coast reaching Lake Sankoria, "trouser-wearing" traders, evidently thereby meaning Europeans, and that they came in boats From this it might be supposed that they came up the Congo from the sea for the purposes of trade, but Mr Monteiro, who has had great experience of the Congo, declared that the Portuguese, on the sea-coast, were quite unable to ascend the river, and he thought it possible that half-caste traders from Cassange, a town in the interior, might strike the Congo below Lake Sankorra, and that those were the people whom Cameron heard of

Thus, although a space of more than 700 miles of absolutely unknown country intervenes between the Lualaba at Nyangwe, and the highest point on the Congo reached by Tuckey in 1816, yet the direction of the river, its volume, the times of its rise and falling, and native report, combine so as to leave no reasonable doubt that the Lualaba is the Congo Dr Behm, who examined the subject very carefully three years ago, was believed by all geographers to have really settled the question by a large field of induction, even without Cameron's independent testimony, but this further support has now been given to the argument, and there can no longer be much doubt upon the subject

Cameron's discoveries west of Tanganyika begin at Nyangwe, and from thence to the point where he crossed Livingstone's routes of 1853–55, near Lake Dilolo, he has traversed not less than 1200 miles of perfectly new country, making known nearly the whole course of the great River Lomame (Lomami) He has also discovered the chain of lakes of Kamolondo (Kamorondo) of which Lake Kassali is the chief member, and a great part of the southern water-parting of the Congo basin The main points of difference and agreement between the hydrography of this region of Central Africa as indicated by Livingstone, and as extended and verified by Cameron, may be best understood by glancing firstly at the main features laid down by Livingstone from observations and report The lakes which Livingstone discovered south-west of Tanganyika (Bangweolo and Moero), have an outflowing river, the Luapula, which he named *Webb's* Lualaba, and which he saw at its exit from Lake Moero and again at Nyangwe Between these points he believed that it formed a great lake, which in his letters from Cazembe's he called Ulenge, but afterwards hearing of it at Nyangwe, he named it Kamolondo or "Lui Water" He believed that this lake received the Lufira, another great tributary from the south, which he named *Bartle Frere's* Lualaba A third great line of drainage in the west, the head of which is indicated on Livingstone's map as being the Kassabi, is the Loeki or Lomame, forming Chibungo or Lake Lincoln in its middle course, and surnamed by him *Young's* Lualaba The Lomame and Kassabi were believed to be the same river, both because the second name of the river, Loeki, is almost the same as the alternative name of the Kassabi, which was Loke, and because in Ladislaus Magyar's account of this river in the country of the Muata Yanvo, it is reported to turn *eastward* in its lower course, and to expand into a great lake (Uhanja)

Livingstone originally laid down three great rivers as forming the head-waters of the Congo Each of those rivers he called Lualaba, because he found that, when they united at Nyangwe, they bore that name. The eastern branch he called Webb's Lualaba, but the real name of this was now discovered to be the Luvwa the central one he called Frere's Lualaba, the real name being the Lufira, and the western one he called Young's Lualaba, the real name being the Lomami The great point established by Cameron was that, although the eastern and western branches were correctly laid down by Livingstone, yet instead of there being one river in the centre, called Frere's Lualaba, there were, in reality, two rivers, one of them being the true Lualaba, the only one which retained the name in its upper course, and giving its name to the lower course, the Africans considering that all the other rivers which joined it were mere tributaries to it A proof of this was found in the fact that, wherever the Lualaba was mentioned in any of the Portuguese travels, it was this central stream which was indicated To Cameron, therefore, was due the credit of having discovered the real and original Lualaba

The geography of the first line of drainage indicated by Livingstone, *Webb's* Lualaba, is not materially altered by Cameron's work, or by the reports that he received, and he places Lake Lanji (Ulenge), from report, in a position not very different from that assigned to it by Livingstone under the name of Kamolondo It would be noticed that, while Livingstone applied the name of Kamolondo to the lake, Cameron showed that it was a chain of lakes bearing that name, or Kamorondo

It is in the second and third lines of drainage, which, it must be remembered, were not seen in any part by Livingstone, that Cameron introduces new and important views of the hydrographic system Compelled to leave the line of the Congo, Cameron crossed the main river, and, reaching the Lomami, followed its eastern bank southward for nearly 200 miles, and later, passed its sources between 9° and 10° s, proving that the Lomami does not originate in the Kassabi, as was surmised, and that the main channel does not expand into a lake A western tributary of the Lomami, however, called the Luwembi, expands into a lake named Iki, which Cameron supposes to be the Chibungo (Lake Lincoln) heard of by Livingstone

Between the line of drainage of Webb's river and the Lomami, Cameron makes known a great chain of lakes, united by a river named the Kamorondo, the upper portion of which he calls the *true* Lualaba The largest lake of this chain, named Kassali, of which Cameron obtained a distant view from near its northern shore, lies west of Lake Mocio, the next of the chain lower down, Lake Kowamba, is said to receive the Lufira (Bartle Frere's Lualaba) from the south The names Kamolondo and Ulenge, both of which are noted by Livingstone, and which he appears to have conceived to belong to the same lake, are thus separately applied, the former to the lake-chain formed by the *true* Lualaba of Cameron, which joins the Webb's Lualaba before it enters the lake of the latter name, Ulenge or Lanji That Lualaba which forms the lake-chain of Kamolondo was first crossed at its head by the Pombeiros going from the Muato Yanvo's capital to Cazembe's in 1806, and Cameron maintains that it is the *true* Lualaba, the proper name of Webb's river, before it enters Ulenge, being Luvwa Notwithstanding these statements of Cameron, it will, no doubt, be maintained by geographers that Webb's Lualaba, or the Luvwa, must be the main stream of the Lualaba river-system, on account of its having a much longer course (as the Chambeze and Luapula) than the tributary Lualaba-Kamorondo

After returning from his excursions in the neighbourhood of Kasongo's, at Kilemba, and his discovery of Lake Kassali, the greater portion of Cameron's journey to where he came upon the country about Lake Dilolo, was along the water-parting of the Congo basin, and this great feature he has defined for a length of upwards of 300 miles, separating the waters flowing northward from the tributaries of the Zambezi The route taken by the Pombeiros of 1806 appears to cross Cameron's track nearly at right angles on the water-parting between 23° and 24° E. longitude They went south-eastward from Muata Yanvo's capital of Kabebe, which, from Cameron's geography, would appear to have been laid down in maps about a degree too far east, and they crossed many tributaries of the *Lulua*, the sources of which Cameron has defined

In the olden time there were two great potentates apparently in this part of Central Africa—one Muata Yanvo, and the other Muata Cazembe, but neither Livingstone nor Cameron ever mentioned Muata Yanvo—the natural inference being that that State had ceased to exist, but it now appeared that there was a chief called Kasongo ruling over the whole of Urua, from near Nyangwe as far as Cazembe's frontier, so that, whatever had become of Muata Yanvo's actual capital, it was very evident that the power which he formerly exercised was now in the hands of Kasongo, though ruling, perhaps, in a different capital.

Afterwards the Pombeiros crossed the head-waters of the Lualaba which Cameron has traced to its lake-chain, and nearer Cazembe's capital they passed the source-streams of the Luvire, which is, doubtless, the Lufira joining the Kamorondo lake-chain

The Liambai, or Liambeji, which Cameron had on his left hand during a great part of his later journey, is the Leeambye, or main head-stream of Livingstone's Zambezi, so that the honour of tracing the source-stream of this vast river belongs to Cameron

Cameron appears to have passed close to Lake Dilolo, and he indicates a lake in the position in which it must lie, but without naming it, and here he again came upon Livingstone's routes, crossing the lines by which the great traveller passed from the Zambezi to Loanda in 1854, and by which he returned down the Zambezi to its mouth in 1855

Returning again to the Lualaba, or Congo, below Nyangwe, we find that Cameron agrees with Livingstone in the report of a great unvisited lake at some distance down the river, and Cameron names it Sankorra

With regard to the great River Lowa, which joins the Congo a short way below Nyangwe, Cameron's supposition that it may be the Buri has no very strong arguments against it The Buri, Victor Babura, or Uelle, is the stream first reported by Petherick from Mundo, and said by him to form the southern boundary of the Niam Niam country It was afterwards heard of, and variously named by Piaggia and the Poncets, and was crossed by Schweinfurth in 1870, and by Miani in 1872 It flows west from the mountains which rise about the north-west of the Albert Nyanza, and was conjectured by Schweinfurth to be the head stream of the river Shari which flows to Lake Chad since he had found that it was altogether a different watershed from that of the Nile Dr. Nachtigal, however, from his researches, and from information gathered in Wadai and Darfur, believes (as he contended, in a paper read before the British Association at Bristol this year) that this river, which he heard of under another name—the Bahr Kuta —is not connected with the Shari, the sources of which river he believes lie nearer to Lake Chad, and he thinks that it is possibly a head stream of the Benue Cameron's supposition has certainly as much probability as this last In support of Cameron's conjecture, it was very probable that the name "Lowa" was the same as "Uelle"

A great part of Cameron's journey lay through the country of *Rua*, or Urua, which appears to be of vast extent From Livingstone, we know that Rua extends from the line of Webb's Lualaba, between Moero and Nyangwe on the east, and Cameron was in Rua on the banks of the Lomami It is interesting to note that Kasongo, who is the great chief of all Urua—and with whom Cameron had apparently much to do—was seen also by Dr Livingstone on the northern side of the Lualaba near Nyangwe, and is described by him as a "fine young man, with European features."

His country also appears to be the meeting-place of half-caste traders from the West Coast, and of the Arabs from Zanzibar

The brief report of the journey which Cameron has sent home gives us but scanty information regarding the general appearance and products of the vast region which he traversed But, judging from the few facts he gives, and especially from the ample details of his map, there can be no doubt it is a well-watered, fertile, and productive extent of country, free from tracts of desert, and surpassing in variety of configuration the region east of Lake Tanganyika We learn, for the first time, that in the neighbourhood of Manyema the Arab traders from Zanzibar and the half-caste Portuguese traders from the West Coast come in contact, and the route followed by Cameron to Benguela, in company with Jose Antonio Alviz, is doubtless the beaten track of the West Coast adventurers A glance at his map shows that this route takes the line of the watersheds, that is the dry uplands, free from swamps and inundations, and cuts the upper waters of all the small tributaries—first, of the Lomami, and afterwards of the Kassabé and the Leeambye The whole region is traversed by low-lying river-valleys, threaded by chains of lakes, which must offer great obstacles to the traveller, especially in the rainy season, unless they are navigable by canoes The Lualaba at Nyangwe lies lowest of all these valleys, and it is probably separated from the basins of the Albert Nyanza and the northern part of Tanganyika by mountain ranges The geographical world and the public will look forward with great interest to the arrival of Lieutenant Cameron, and the communication by him of further details of his wonderful journey

Lieutenant Cameron spoke in warm terms of his reception by the Portuguese authorities at Benguela and Loanda Care had previously been taken through the Foreign Office to interest the Portuguese Government in his favour, and instructions were sent out from Lisbon that he should be well treated on his arrival, and, in advising one of his bills, he said that he had been received with open arms by the Portuguese authorities

Mr MONTEIRO said he had spent many years in constant travel and exploration in Angola, and about the Congo, and was therefore able to bear testimony to the value of Lieutenant Cameron's wonderful exploit, in passing through so many thousands of miles in the interior of Africa, left to his own resources, with very little goods equivalent to money in that country, with which to pay for his food or passage through the native territories The most important fact in the journey seemed, to him, to be the meeting with the Mulatto trader at Kilemba The European-Portuguese traders from the West Coast did not go further up than Bihè and Cassange, but from those places they sent their black traders in every direction Large quantities of wax were brought down —hundreds of tons per annum—as well as a great deal of ivory It was a great pity that, instead of going down to Bihè, Lieutenant Cameron had not gone to Cassange, about 300 miles from Loanda, as he would have found the road pretty clear to the northward to the River Congo The whole of that part of the interior formerly supplied thousands of slaves for the slave-trade, and the fact that traders had been there before, showed that future explorers would meet with but little difficulty in going there from the West Coast. The natives were used to trading, and would, no doubt, admit a white man over the whole of the country At all events, though he might meet with impediments in some places, he would find a free passage in others The statement that "trouser-wearing" traders visited Lake Sankorra could not apply to white men, but probably to the *pombeiros* from Cassange, because all the more civilised natives about Loanda, and inland of it, were fond of cutting up their slips of cloth and making trousers. White men had not been able to go much further than about Boma, and below the falls He thought that region would be found to be very much more complicated than many at present fancied. Geographers had not taken into account the large rivers running immediately north of the Congo, between that river and the equator. He inclined to the opinion that the Rivers Mayumba and Quillo, and others, drained a large lake country in the interior. No gold-dust had ever been brought down to the coast, and he could not account for the report which Lieutenant Cameron alluded to. The principal produce now brought from the interior by the Congo was palm-oil.*

Mr **FRANCIS GALTON** observed that Lieutenant Cameron's letters afforded another proof of how hazardous it was to speculate on the reports of the natives in Africa. Even so accomplished a traveller as Livingstone was wrong with regard to the Lualabas, the outlet of Tanganyika, and the Victoria Nyanza. One thing, however, was now certain, that the chains of lakes to the west of Tanganyika formed the upper basin of the Congo. What became of the river Uelle, no one could at present say, but there certainly was a large river to be accounted for, a river that had been spoken of by many travellers, Barth among the number. Every member of the Society would be most curious to hear more about the Lukuga, the outlet of Tanganyika. It appeared that the Lualaba into which it runs was only 1400 feet above the sea, and lying in a valley that was little more than a marsh, Tanganyika being only 120 miles distant, but 1300 feet higher. This shows that the outlet must have a most extraordinary succession of cataracts, probably Lieutenant Cameron knows of these, and will have something to tell us about them. The descriptions of Africa they had heard, brought strongly before his mind the strange spectacle that Africa would present to an eye placed some distance above the earth's surface. No other continent contained such marked contrasts; the broad Sahara in the north, the rich tropical vegetation between the tropics, a region of swamps, and then a dry district again in the south. He wished that some artist-geographer would paint in colours a bird's-eye view of Africa, as near the reality as the imagination could attain.

The Rev. **HORACE WALLER** said that Lieutenant Cameron's pluck and courage were almost unexampled in the history of geographical explorations. One circumstance underlaid much of the plan on which he had pursued his investigations, and he felt it would be hard to forget it in reviewing these interesting accounts. No doubt the good intention with which he set out had had much to do with his great triumph. When he found that Livingstone was dead, he felt that what that illustrious traveller had laid down his life for, should be taken up by successors who were hale and strong. In all probability, Cameron, when he inspected the effects of Livingstone at Unyanyembe, when on their way to the coast, closely scrutinised the great traveller's maps and writings; in fact, Livingstone might be regarded as setting the lesson which the young explorer had most worthily and honourably carried out, and they had heard him referring to-night repeatedly to Livingstone's remarks. There was still a question to be settled with regard to the Lualaba. Livingstone traced the Chambeze into Lake Bangweolo, thence into Moero, as the Luapula, and out of that lake as the Lualaba, subsequently taking the name of the Ugarrowwa, to the north. Cameron had stated that the river leaving Moero was not the Lualaba, but he had not been there; whereas, Livingstone, who had visited the spot, said it was called by that name. It was now, however, settled that those waters were connected with the Congo, and not with the Nile. One other thing Lieutenant Cameron had done, namely, pointed out the iniquities of the abominable slave-trade. It appeared that Tipo tipo, the greatest slave-hunter of that part of Africa, whom Livingstone came across from time to time, had now shifted his quarters, until the slavers from the East Coast and those from the West met in the territories of Kasongo.

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* After the meeting, Mr. Robert Capper (late Lloyd's Agent for the Congo and its district) addressed a letter to the President, in which he gives some interesting details of native trade in the interior, corroborating the account given by Mr. Monteiro, especially with regard to ivory (Monteiro, 'Angola and the River Congo,' i, p. 139). He writes as follows:—

"Having traded some years in Africa, particularly on the Congo and the district lying between that river and St. Paulo de Loanda, it may interest you to know that the large quantity of ivory brought there is brought down by natives ignorant of the language in general use on the sea-board; they travel together in caravans, or 'cabuccas' in the native tongue, and their journey takes about three moons (or months). Africans do not travel fast, particularly in a body—on an average we had a 'cabucca' down every six weeks, and I have known 7000 tusks of ivory to come down at one time. These traders go to and fro, appearing again after about nine months. They have repeatedly told me they bought the ivory at a market on the shores of a large piece of water like that before them (the ocean) and it was conveyed there by the sellers in very large canoes, so large that the people lived on board and had fires in them. In coming down they pass by a large river now and then, and some of the villages and towns they pass through are not far from the banks of the Congo. I conclude this will be the Lake Sankorra of Lieut. Cameron. With reference to what he says as to palm-oil, I may mention that this product is only found in a belt along the line of sea-coast of not more than 150 to 200 miles in width, and I have never heard of any gold-dust about the Congo.

(Signed) "ROBERT CAPPER."

The PRESIDENT said he should not be doing justice to Lieutenant Cameron if he did not further allude to the extraordinary extent and value of the instrumental observations which had already reached England. Only a first instalment had, as yet, been received; but a cursory inspection of them had astonished the scientific officers who had seen them. They had not yet been computed, but the Curator of the Society had written a report upon them: "The following is a summary of the distances:—Zanzibar to Lunga Mandi's, near Lake Kassali, 2143 miles; Lunga Mandi's to Benguela, 810 miles; total distance of route travelled over, 2953 miles. About 1200 miles of this is over entirely new ground. The astronomical observations that have already been received, reach only to Lunga Mandi's, and they determine 85 positions by 706 observations for latitude and longitude. The observations for the heights of places are 3718 in number; they were read off, on the average, three times a day, and by means of these Lieutenant Cameron had drawn and sent home profile sections of the country along the line of his route. The longitudes of many important points have been determined by a numerous series of lunar observations: thus, for Nyangwe he has 61 lunar observations; for Kisenga (in the previously unknown region) 112; for Kanyenyi 35, and so forth." When it was remembered that the previous knowledge of the longitudes of the interior of Africa was founded upon one single lunar observation obtained at Ujiji, it would at once be apparent what an enormous difference Lieutenant Cameron's work had made in that respect. As far as the science of Geography was concerned, that was the great and essential value of Lieutenant Cameron's journey. The Royal Geographical Society was not instituted for the purpose of merely registering personal adventures or sensational journeys; they had a higher object in view, that of the advancement of pure, substantive, scientific Geography, and it was for his labours in that respect that their special thanks were due to Lieutenant Cameron. He was delighted to see the young explorer's parents present to hear the tribute of admiration which, in the name of the Society, he tendered to him. The crowded state of the meeting, and the attention with which the papers had been listened to, afforded an earnest of the hearty and cordial reception which they would give to Lieutenant Cameron when they had the happiness of seeing him amongst them From some communications which had taken place, he trusted that their Honorary President, the Duke of Edinburgh, would do them the honour of taking the chair on that occasion The Council of the Society had that day passed a vote, advancing a further sum of 1000*l* from the funds of the Society towards clearing off the expenses incurred by the Expedition

The meeting then adjourned

ADDITIONAL NOTICES.

(Printed by order of Council)

1. *Letters of* Mr. H M Stanley *on his Journey to Victoria Nyanza, and Circumnavigation of the Lake.**

I

Village of Kagehyi, District of Uchambi, Usukuma, on the
Victoria Niyanza, March 1, 1875 †

The second part of the programme laid before me as Commander of the Anglo-American Expedition ended successfully at noon on the 27th February, 1875 The great lake first discovered by Captain Speke—the Victoria Niyanza—was sighted and reached by us on that day, and it is with feelings of most devout gratitude to Almighty God for preserving us, amid manifold perils, that I write these lines

It seems an age since we started from Mpwapwa of Usagara, whence I despatched my last letter to you We have experienced so much, seen and suffered so much, that I have carefully to recapitulate in my mind, and turn to my note-book often besides, to refresh my recollection of even the principal events of this most long, arduous, and eventful march to the Victoria Lake I promised you in my last letter that I would depart as soon as practicable from the old route to Unyanyembe, now so well known, and would, like the patriarch Livingstone, strike out a new line to unknown lands. I did so In our adventurous journey north I imperilled the Expedition, and almost brought it to an untimely end, which, however, happily for me, for you, and for geographers, a kind Providence averted.

On leaving Mpwapwa we edged northward across the desert of the Mgunda Mkali, or the Forest region, leaving the vain chief of Mbumi far to the south, and traversed Northern Ugogo with the usual experiences attending travellers in Southern Ugogo The chiefs practised the regular arts, fleeced us of property, and black-mailed us at every opportunity But occasionally we met tribes more amiably disposed towards strangers, although at times we had to pay heavier tribute in other chiefs' lands We crossed broad and bleak plains, where food was scarce, and cloth vanished fast, to enter hilly districts where provisions were abundant, the people civil, and the chiefs kind We traversed troublesome districts where wars and rumours of wars were rife, the people treacherous and hostile, to enter countries lying at the mercy of the ferocious Wahumba on the north, and the Wahebu to the south. Thus good and evil fortune alternated during our travels through Ugogo—an epitome in brief of our after-experiences. Furious rainy tempests accompanied us constantly, and some days Nature and man alike warred against us, while on others both seemed combined to bless us. Under our generally adverse fates my command seemed to melt away, men died from fatigue and famine, many were left behind ill, while many, again, deserted. Promises of reward, kindness, threats, punishments, had no effect. The Expedition seemed doomed. The white men, though elected out of the ordinary class of Englishmen, did their work bravely—nay, I may say heroically. Though suffering from fever and dysentery, insulted by natives, marching under the heat and equatorial rainstorms, they at all times proved themselves of noble, manly natures, stout-hearted, brave, and—better than all—true Christians. Unrepining, they bore their hard fate and worse fare, resignedly they endured their arduous troubles, cheerfully performed their allotted duties, and at all times commended themselves to my good opinion.

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* Reprinted, by permission, from the 'Daily Telegraph' and 'New York Herald'

† 'Daily Telegraph,' Oct. 15, 1875

We reached the western frontier of Ugogo on the last day of 1874. After a rest of two days we thence struck direct north, along an almost level plain, which some said extended as far as Niyanza. We found by questioning the natives that we were also travelling along the western extremity of Wahumba, which we were glad to hear, as we fondly hoped that our march would be less molested. Two days' progress north brought us to the confines of Usandawi, a country famous for elephants, but here our route inclined north-west, and we entered Ukimbu, or Uyanzi, at its north-eastern extremity. We had hired guides in Ugogo to take us as far as Iramba, but at Muhalala, in Ukimbu, they deserted. Fresh guides were engaged at Muhalala, who took us one days' march farther north-west, but at night they also disappeared, and in the morning we were left on the edge of a wide wilderness without a single pioneer. On the roads the previous day the guides had informed us that three days' march would bring us to Urimi, and, relying on the truth of the report, I had purchased two days' provisions, so that this second desertion did not much disconcert us, nor raise any suspicion, though it elicited many unpleasant remarks about the treachery of the Wagogo. We therefore continued our journey, but, on the morning of the second day, the narrow, ill-defined track which we had followed became lost in a labyrinth of elephant and rhinoceros trails. The best men were despatched in all directions to seek the vanished road, but they were all unsuccessful, and we had no resource left but the compass. The next day brought us into a dense jungle of acacia and euphorbia, through which we had literally to push our way by scrambling and crawling along the ground under natural tunnels of embracing shrubbery, cutting the convolvuli and creepers, thrusting aside stout, thorny bushes, and by various detours taking advantage of every slight opening the jungle afforded. This naturally lengthened our journey, and protracted our stay in the wilderness. On the evening of the third day the first death in this dismal waste occurred.

The fourth day we made but 14 miles, and the march was threefold more arduous than the preceding tramp. Not a drop of water was discovered, and the weaker people, labouring beneath their loads, and undergoing besides, hunger and thirst, lagged behind the vanguard many miles, which caused the rearguard under two of the white men much suffering. As the last files advanced they shouldered the loads of the weaker men, and endeavoured to encourage them to resume the march. Some of these poor fellows were enabled to reach camp, where their necessities were relieved by medicine and restoratives. But five strayed from the path which the passing Expedition had made, and were never seen alive again. Scouts sent out to explore the woods found one dead about a mile from our road, the others must have hopelessly wandered on until they also fell down and died.

On the fifth day we arrived at a small village, lately erected, called Uveriveri, the population of which consisted of four negroes, their wives, and little ones. These people had not a grain of food to spare. Most of our Expedition were unable to move for hunger and fatigue. In this dire extremity I ordered a halt, and selected twenty of the strongest to proceed to Suna, 29 miles north-west from Uveriveri, to purchase food. In the interval I explored the woods in search of game, but the quest was fruitless, though one of my men discovered a lion's den, and brought me two young lions, which I killed and skinned. Returning to camp from the fruitless hunt, I was so struck with the pinched faces of my poor people that I could have almost wept if I might have done so without exciting fear of our fate in their minds, but I resolved to do something towards relieving the pressing needs of fierce hunger. To effect this, a sheet-iron trunk was emptied of its contents, and being filled with water, was placed on the fire. I then broke open our medical stores, and took 5 lbs of Scotch oatmeal and three tins of Revalenta Arabica, with which I made gruel to feed over 220 men. It was a rare sight to see these poor famine-stricken people hasten to that Torquay dress-trunk and assist me to cook the huge pot of gruel, to watch them fan the fire to a fiercer heat, and with their gourds full of water stand by to cool the foaming liquid when it threatened to overflow, and it was a still better sight to watch the pleasure steal over their faces as they ate the welcome food. The sick and weaker received a larger portion near my tent, and another tin of oatmeal was opened for their supper and breakfast. But a long time must elapse before I shall have the courage to express my feelings whilst I waited for the return of my people from Suna with food, and fruitless would be the attempt to describe the anxiety with which I listened for the musketry announcing their success. After 48 hours' suspense we heard the joyful sounds, which woke us all into new life and vigour. The grain was most greedily seized by the hungry people, and so animating was the report of the purveyors that the soldiers one and all clamoured to be led away that afternoon. Nowise loth myself to march from this fatal jungle, I assented, but two more poor fellows breathed their last before we left camp.

We pitched that night at the base of a rocky hill overlooking a broad plain, which, after the intense gloom and confined atmosphere of the jungle, was a great pleasure to us, and next day, striking north along this plain, after a long march of 20 miles, under a fervid sun, we reached the district of Suna, in Urimi. At this place, we discovered a people remarkable for their manly beauty, noble proportions, and utter nakedness. Neither man nor boy wore either cloth or skins, the women bearing children alone boasted of goat-skins. With all their physical comeliness and fine proportions, they were the most suspicious people we had yet seen. It required great tact and patience to induce them to part with food for our cloth and beads. They owned no chief, but respected the injunctions of their elders, with whom I treated for leave to pass through their land. The permission was reluctantly given, and food was grudgingly sold, but we bore with all this silent hostility patiently, and I took great care that no overt act on the part of the Expedition should change their suspicion into hatred. Our people were so worn out with fatigue that six more poor fellows died here, and the sick list numbered thirty. Here also Edward Pocock fell seriously ill of typhoid fever. For his sake, as well as for the other sufferers, I halted in Suna four days, but it was evident that the longer we stayed in their country the less we were liked by the natives, and it was incumbent on us to move, though much against my inclination. There were many grave reasons why we should have halted several days longer, for Edward Pocock was daily getting worse, and the sick-list increased alarmingly, dysentery, diarrhœa, chest diseases, sore feet, tasked my medical knowledge to the utmost, but prudence forbade a stay. The rear-guard and captains of the Expedition were therefore compelled to do the work of carriers, and every soldier, for the time being, was converted into a *pagazi*, or porter. Pocock was put into a hammock, the sick and weakly were encouraged to do their utmost to move on with the Expedition to more promising lands, where the natives were less suspicious, where food was more abundant, and where cattle were numerous. Imbued with this hope, the entire camp resumed its march across the clean, open, and well-cultivated country of Urimi.

Chiwyu was reached about ten o'clock, after a short walk, and here the young Englishman, Edward Pocock, breathed his last, to the great grief of us all. According to two rated pedometers, we had finished the 400th mile of our march from the sea, and had reached the base of the watershed whence the trickling streams and infant waters begin to flow Nileward, when this noble young fellow died. We buried him at night, and a cross, cut deep into a tree, marks his last resting-place at Chiwyu. As we travelled north, we became still more assured that we had arrived in the dewy land, whence the extreme southern springs, rivulets, and streams discharge their waters into the Nile. From a high ridge overlooking a vast extent of country, the story of their course was plainly written in the deep depressions and hollows trending northward and north-westward, and as we noted these signs of the incipient Nile, we cherished the growing hope that before long we should gaze with gladdened eyes on the mighty reservoir which collected these waters that purled and rippled at our feet, into its broad bosom, to discharge them in one vast body into the White Nile. From Chiwyu we journeyed two days through Urimi to Mangura, where Kaif Halleck—the carrier of Kirk's letter-bag to Livingstone, whom I compelled to accompany me to Ujiji in 1871—was brutally murdered. He had been suffering from asthma, and I had permitted him to follow the main body slowly, the rear-guard being all employed as carriers, because of the heavy sick list, when he was waylaid by the natives and hacked to pieces. This was the first overt act of hostility on the part of the Warimi. Unable to fix the crime on any particular village, we resumed our journey, and entered Ituru, a district in Northern Urimi, on the 21st of January.

The village near which we camped was called Vinyata, and was situated in a broad and populous valley, containing, probably, some two or three thousand souls. Here we discovered the river which received all the streams that flowed between Vinyata and Chiwyu. It is called Leewumbu, and its flow from this valley is west. Even in the dry season it is a considerable stream, some 20 feet in width, and about 2 feet in depth, but in the rainy season it becomes a deep and formidable river. The natives received us coldly, but as we were only two days' journey from Iramba, I redoubled my exertions to conciliate the surly, suspicious people, and that evening my efforts seemed crowned with success, for they brought milk, eggs, and chickens for sale, for which I parted freely with cloth. The fame of my liberality reached the ears of the great man of the valley, the magic doctor, who, in the absence of a recognised king, is treated by the natives with the deference and respect due to royalty. This important personage brought me a fat ox the second day of my arrival at Vinyata, and, in exchange, received double its value in cloth and beads, while a rich present was bestowed upon his brother and son. The great man begged for the heart of the slaughtered ox, which was also given him, and other requests were likewise honoured by prompt compliance.

We had been compelled to take advantage of the fine sun which shone this day to dry the bales and goods, and I noticed, though without misgiving, that the natives eyed them greedily. The morning of the third day the magic doctor returned again to camp to beg for some more beads to "make brotherhood with him" To this, after some slight show of reluctance to give too much, I assented, and he departed apparently pleased Half an hour afterwards, the war-cry of the Waturu was heard resounding through each of the 200 villages of the Leewumbu Valley This war-cry was similar to that of the Wagogo, and phonetically it might be spelt "Hehu, A Hehu," the latter syllables drawn out in a prolonged cry—thrilling and loud As we had heard the Wagogo sound such war-notes upon every slight apparition of strangers, we imagined that the warriors of Ituru were summoned to contend against some marauders, like the warlike Waramba, or other malcontent neighbours, and, nothing disturbed by it, we pursued our various avocations, like peaceful beings, fresh from our new brotherhood with the elders of Ituru Some of our men were gone out to the neighbouring pool to draw water for their respective messes, others had wandered off to cut wood, others, again, were about starting to purchase food, when, suddenly, we saw the outskirts of the camp darkened by about a hundred natives in full war costume Feathers of the bustard, the eagle, and the kite waved above some of their heads, the mane of the zebra and the giraffe encircled other swarthy brows, in their left hands they held bows and arrows, while in their right they bore spears

This hostile gathering naturally alarmed us, for what had we done to occasion disturbance or war? Remembering the pacific bearing of Livingstone when he and I were menaced by the cannibal Wabembe, I gave orders that none should leave camp until we could ascertain what this hostile proceeding meant, and that none should by any demonstration provoke the natives While we waited to see what the Waturu intended to do, their numbers increased tenfold, and every bush and tree hid a warrior Our camp was situated on the edge of a broad wilderness that extended westward many days' march, but to the north, east, and south, nothing was seen save villages and cultivated ground, which, with the careless mode of agriculture in vogue amongst savages, contained acres of dwarf shrubbery I doubt, however, whether throughout this valley a better locality for a camp could have been selected than the one we had chosen Fifty or sixty yards around us was open ground, so that we had the advantage of clear space to prevent the approach of an enemy unseen A slight fence of bush served to screen our numbers from those without the camp, but having had no occasion to suspect hostilities, it was ill adapted to shield us from attack

When the Waturu had become so numerous in our vicinity that we no longer doubted they were summoned to fight us, I despatched a young man who knew their language to ascertain their intention As he advanced towards them six or seven warriors drew near to talk with him When he returned he informed us that one of our men had stolen some milk and butter from a small village, and that we must pay for it in cloth The messenger was sent back to tell them that white men did not come to their country to rob or quarrel, that they had but to name the price of what was stolen to be paid at once, and that not one grain of corn or millet-seed should be appropriated by us wrongfully Upon this the principal warriors drew nearer, until we could hear their voices plainly, though we did not understand the nature of the conversation The messenger informed us that the elders demanded four yards of sheeting, which was about six times the value of the stolen articles, but at such a moment it was useless to haggle over so trifling a demand, and the cloth was paid When it was given to them the elders said they were satisfied, and withdrew.

It soon became evident, however, that though the elders were content the warriors were not, as they could be seen hurrying by scores from all parts of the valley, and gesticulating violently in crowds Still we waited patiently, hoping that if the old men and principal warriors were really well disposed towards us their voices would prevail, and that they would be able to assuage the wild passions which now seemed to animate the others As we watched them we noted that about two hundred detached themselves from the gesticulating crowds east of the camp, and disappeared hurrying to the thick bush west of us Soon afterwards one of my men returned from that direction bleeding profusely from the face and arm, and reported that he and a youth, named Sulieman, were out collecting firewood when they were attacked by a large crowd of savages, who were hidden in the bush A knobstick had crushed the man's nose and a spear had severely wounded him in the arm, but he had managed to escape, while Sulieman was killed, a dozen spears having been plunged into his back

This report, and the appearance of their bleeding comrade, so excited the soldiers of the Expedition that they were only with the utmost difficulty restrained from beginning a battle at once Even yet I hoped that war might be prevented by a little diplomacy, while I did not forget to open the ammunition-boxes and prepare for the worst But much was meanwhile to be done The enclosure of the camp required to be built up, and something of a fortification was necessary to repel the attack of such a large force While we were thus preparing without ostentation to defend ourselves from what I conceived to be an imminent onslaught, the Waturu, now our declared enemies, advanced upon the camp, and a shower of arrows fell all round us Sixty soldiers, held in readiness, were at once ordered to deploy in front of the camp, fifty yards off, the Wanguana, or freemen of Zanzibar, obedient to the command, rushed out of the camp, and the battle commenced Immediately after, these sixty men, with axes, were ordered to cut bushes and raise a high fence of thorn around the camp, while twenty more were employed to throw up lofty platforms like towers within, for sharp-shooters We busied ourselves in bringing the sections of the *Lady Alice* inside to make a central refuge for a last resistance, and in otherwise strengthening the defences Every one toiled with a will, and while the firing of the skirmishers, growing more distant, announced that the enemy was withdrawing, we were left to our task unmolested When the camp was prepared, I ordered the bugler to sound the retreat, in order that the savages might have time to consider whether it was politic for them to renew the fight

The skirmishers now returned and announced that fifteen of the enemy were killed, while a great many more were wounded and borne off by their friends All my men had distinguished themselves—even "Bull," my British bull-dog, had seized one of the Waturu by the leg, and had given him a taste of the power of the sharp canines of his breed, before the poor savage was mercifully despatched by a Snider bullet We rested that day from further trouble, and the next morning we waited events until nine o'clock, when the enemy appeared in greater force than ever, having summoned their neighbours all round to assist them, as I now felt assured, in our ruin Though we were reluctant to war upon people whom I the previous day thought might still be converted into friends, we were not slow to continue fighting if the natives were determined on hostilities Accordingly I selected four experienced men to lead four several detachments, and gave orders that they should march in different directions through the valley, and meet at some high rocks distant five miles off; that they should seize upon all cattle, and burn every village as soon as taken. Obedient to the command they sallied forth from the camp, and thus began the second day's fight

They were soon vigorously engaged with the enemy, who fled fast and clamorous before them to an open plain on the banks of the Leewumbu. The detachment under Farjalla Christie became too excited, and because the enemy ran, imagined that they had only to show themselves to cause every native to fly, but once on the plain—having drawn them away into isolation some miles from any succour—the negroes turned upon them and slaughtered the detachment to a man, except the messenger, who had been detailed to accompany the party in order to report success or failure I had taken the precaution to send one swift-footed man along with each detachment for this purpose The messenger came from Farjalla to procure assistance, which was at once despatched, though, indeed, too late to aid the unfortunate men, but not too late to save a second detachment from a like fate, for the victorious enemy, after slaughtering the first division, had turned upon the second with the evident intention to cut up in detail the entire force opposed to them When the support arrived they found the second detachment all but lost Two soldiers had been killed, the captain, Ferahan, had a deep spear-wound in his side, the others were hemmed in A volley was poured into the rear of the astonished enemy, and the party was saved With their combined forces our people discharged a second volley, and then continued their march almost unopposed to the northern and eastern extremity of the valley Meanwhile, smoke was seen issuing from the south and south-east, informing us that the third and fourth detachments were pursuing their way victoriously, and soon a score or more villages were enwrapped in dense volumes of smoke Even at a distance of 8 miles we beheld burning villages, and shortly after the blazing settlements to the north and east announced our triumph on all sides Towards evening the soldiers returned, bringing cattle and an abundance of grain to the camp, but when the muster-roll was called I found I had lost twenty-one men, who had been killed, while thirty-five deaths of the enemy were reported

The third day we renewed the battle with sixty good men, who received instructions to proceed to the extreme length of the valley and destroy what had been left on the previous day These came to a strong and large village on the north-east, which, after a slight resistance, they entered, loading themselves there with grain, and afterwards setting the village on fire Long before noon it was clearly seen that the savages had had enough of war, and were quite demoralised, so that our people returned through the now silent and blackened valley without molestation Just before daybreak on the fourth day we quitted our camp and continued our journey north-west, with provisions sufficient to last us six days, leaving the people of Ituru to ponder on the harsh fate they had drawn on themselves by their greed, treachery, and wanton murderous attack on peaceful strangers

We were still a formidable force, strong in numbers, guns, and property, though, for an Expedition destined to explore so many thousand miles of new countries, we had suffered severely I had started from the coast with over 300 men, but when I reviewed the Expedition at Mgongo Tembo, in Iramba, which we reached three days after departing from the scene of our conflict, I found I had but 194 men left In less than three months I had already lost by dysentery, famine, heart-disease, desertion, and war, over 120 men, natives of Africa, and one European I have not now the time—for my work is but beginning—to relate a tithe of our adventures, or how we suffered You can better imagine our perils, our novel and strange fortunes, if you reflect on the loss of 120 men out of a force so limited. Such a reduction even in a strong regiment would be deemed almost a catastrophe. What name will you give it when you cannot recruit your numbers, when every man that dies is a loss that cannot be repaired, when your work, which is to last years, is but commencing, when each morning you say to yourself, "This day may be your last"?

On entering Iramba we came upon a land where to all strangers that appeared the natives called out "Mirambo and his robbers are coming." But a vast amount of patience and suave language saved us from the doom that everywhere threatens this now famous chieftain Despite, however, the countless medicines and magic arts that have been made and practised against him, Mirambo yet lives. He seems to make war upon all mankind in this portion of the African interior, and appears to be possessed of ubiquitous powers. We heard of him advancing upon the natives in Northern Ugogo, Ukimbu was terror-stricken at his name, the people of Unyanyembe were still fighting him, and here, in Iramba, he had been met and fought, and was again daily expected. As we journeyed on through Iramba and entered Usukuma his fame increased, for we were now drawing near some of the scenes of his wildest exploits. When we approached the Victoria Niyanza he was actually fighting but a day's march from us with the people of Usanda and Masari, and a score of times we came near being plunged into conflicts, because the natives mistook our Expedition for Mirambo's force. Our colour, however, saved us, before we became actually engaged in the struggle.

Various were our fortunes in our travels between Mgongo Tembo, in Iramba, and the Niyanza. We traversed the whole length of Usukuma, through the districts of Mombiti, Usiha, Mondo, Sengerema, and Marya, and, passing through Usmaow, re-entered Usukuma by Uchambi, and arrived at the lake after a march of 720 miles. As far as Western Ugogo I may pass over the country without any attempt at description, since the public may obtain a detailed account of it in my work, 'How I found Livingstone.' Thence north is a new country to all, and a brief description may be interesting to students of African geography.

North of Mzanza a level plain extends as far as the frontier of Usandawi, a distance of 35 English miles. At Mukondoku the altitude, as indicated by two first-rate aneroids, was 2800 feet. At Mtiwi, 20 miles north, the altitude was 2825 feet. Diverging west and north-west, we ascended the slope of what was apparently a lengthy mountain wall, but upon arriving at the summit we ascertained this to be a wide plateau, covered with forest. The plateau has an altitude of 3800 feet at its eastern extremity, but as it extends westward it rises to a height of 4500 feet. It embraces all Uyanzi, Unyanyembe, Usukuma, Urimi, and Iramba—in short, all that part of Central Africa lying between the valley of the Rufiji south and the Victoria Niyanza north, and the mean altitude of this broad upland cannot exceed 3500 feet.* From Mzanza to the Niyanza is a distance of nearly 300 geographical miles, yet at no part of this long journey did the aneroids indicate a higher altitude than 5100 feet above the sea.

As far as Urimi from the eastern edge of the plateau the land is covered with a thick jungle of acacias, which by its density strangles all other species of vegetation. Here and there only in the cleft of a rock a giant euphorbia may be seen, sole lord of its sterile domain. The soil is shallow, and consists of vegetable mould mixed largely with sand and detritus of the bare rocks which crown each knoll and ridge, and which testify too plainly to the violence of the periodical rains. In the basin of Matongo, in Southern Urimi, we were informed by the ruins of hills and ridges, relics of a loftier upland, of what has been effected by Nature in the course of long ages. No *savant* need ever expound to the traveller who views those rocky ruins the geological history of this country. From a distance we viewed the glistening, naked, and riven rocks as a most singular scene, but when we stood amongst them, and noted the appearance of the fragments of granite, gneiss, and porphyry, peeled, as it were, rind after rind, like an onion, or leaf after leaf, like an artichoke, until the rock was wasted away, it seemed as if Dame Nature had left these stony anatomies, these hilly skeletons, to demonstrate her laws and career. It appeared to me as if she said, "Behold my broad basin of Matongo, with its teeming villages, and herds of cattle, and fields of corn, surrounded by these bare rocks—in primeval time this upland was covered with water, it was the bed of a vast sea. The waters were dried, leaving a wide expanse of level land, upon which I have caused heavy rains to fall five months out of each year during all the ages that have elapsed since first the hot sunshine fell upon the soil. These rains washed away the loose sand and made deep furrows in course of time, until at certain places the rocky kernel under the soil began to appear. The furrows became enlarged, the water frittered away their banks, and conveyed the earth to lower levels, through which it wore away a channel first through the soil, and lastly through the rock itself, which you may see if you but descend to the bottom of that basin. You will there behold, worn through the solid rock, a fissure some 50 feet in depth, and, as you look on that, you will have an idea of the power and force of tropical rains. It is through that channel that the soil, robbed from these rocks, has been carried away towards the Niyanza to fill its depths, and in time make dry land of it." You may ask how came these once solid rocks, which are now but skeletons of hills and stony heaps, to be thus split into so many fragments. Have you never seen the effect of water thrown upon lime? These solid rocks have been broken and peeled in an almost similar manner. The tropical sun heated the surface of these rocks to an intense degree, and the cold rain then falling caused the rocks to split and peel as we now see them.

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* Evidently more correctly given as 4500 feet in the 'New York Herald' of October 11th.—Ed.

Such is really the geological history of this country. Ridge after ridge, basin after basin, from Western Ugogo to the Niyanza, tell the same tale, but it is not until we enter Central Urimi that we begin to marvel at the violence of the process by which Nature has thus transformed the face of the land. For here the perennial springs and rivulets first unite and form rivers, after collecting and absorbing the moisture from the watershed, and these rivers, though but gentle streams during the dry season, become formidable during the rains. It is in Central Urimi that the Nile levies its earliest tribute upon Equatorial Africa, and if you look upon the map and draw a line east from the latitude of Ujiji to longitude 35° E., you will strike upon the sources of the Leewumbu, the extreme southern feeder of the Victoria Niyanza. In Iramba, between Mgongo Tembo and Mombiti, we came upon what must have been in former times an arm of the Victoria Niyanza. It is called the Luwamberri Plain, after a river of that name, and is about 40 miles in width. Its altitude is 3775 feet above the sea, and but a few feet above the Victoria Niyanza. We were fortunate in crossing the broad shallow stream in the dry season, for during the *masika*, or rainy season, the plain is converted into a wide lake.

The Leewumbu River, after a course of 170 miles, becomes known in Usukuma as the Monunguh River. After another run of 100 miles, it is converted into the Shimeeyu, under which name it enters the Victoria, east of this port of Kagehyi. Roughly, the Shimeeyu may be said to have a length of 350 miles. After penetrating the forest and jungle west of the Luwamberri we enter Usukuma, a country thickly peopled and rich in cattle. It is a series of rolling plains, with here and there, far apart, a chain of jagged hills. The descent to the lake is so gradual that I expect to find upon sounding it, as I intend to do, that, though it covers a vast area, it is very shallow.

Now, after our long journey, the Expedition is halted a hundred yards from the lake, and as I look upon its dancing waters I long to launch the *Lady Alice*, and venture out to explore its mysteries. Though on its shore, I am still as ignorant of its configuration and extent as any man in England or America. I have questioned the natives of Uchambi closely upon the subject at issue, but no one can satisfy me—though they speak positively—whether the lake is one piece of water or more. I hear a multitude of strange names, but whether they are of countries or lakes it is impossible to divine, for the people's knowledge of geography is naturally very superficial My impression, however, is that Speke, in his bold sketch and imagined outline, is nearer the truth than Livingstone, who reported upon hearsay at a great distance from its shores As soon as I can finish my letters, the sections of the *Lady Alice* shall be screwed together, the first English boat that ever sailed on the African lakes shall venture upon her mission, and I shall not rest until I have thoroughly explored every nook and cranny of the shores of the Victoria It is with great pride and pleasure I think of our success in conveying such a large craft safely through the hundreds of miles of jungle which we have traversed, and just now I feel as though the entire wealth of the universe could not bribe me to turn back from my work. Indeed, it is with the utmost impatience that I contemplate the task of writing my letters, before starting upon the more agreeable work of exploring, but I remember the precept, "Duty before pleasure"

I hear strange tales about the countries on the shores of this lake, which make me still more eager to start One man talks about a territory peopled with dwarfs, and another with giants, while a third is said to possess a breed of such large dogs that even my mastiffs are quite small compared to them All these may be idle romances, and I lay no stress on anything reported to me, as I hope to be enabled to see with my own eyes all the wonders of those unknown countries

It is unfortunate that I have not Speke's book with me, but a map of Central Africa which I carried here contains the statement in brackets that the Victoria Niyanza has an altitude of only 3308 feet above the ocean If this statement is on Speke's authority, either he is wrong, or I am, for my two aneroids, almost fresh from England, make it much higher One ranges from 3550 to 3650 feet, the other from 3575 to 3675 feet * I have not boiled my thermometers yet, but intend doing so before starting on the work of exploring the lake I have no reason to suspect that the aneroids are at fault, as they are both first-class instruments, and have been carefully carried with the chronometers With regard to Speke's position of Muanza, I incline to think that he is right, but, as I have not visited Muanza, I cannot tell The natives point it out westward of Kagehyi, and but a short distance off The position of the port of Kagehyi is south latitude 2 deg. 31 min, east longitude 33 deg 13 min

I mustered the men of the Expedition yesterday, and ascertained it to consist of three white men and 166 Wanguana soldiers and carriers, twenty-eight having died since leaving Ituru, thirty days ago Over one-half of our force has thus been lost by desertion and deaths This is a terrible fact, but I hope that their long rest here will revive the weak and strengthen the strong The dreadful scourge of the Expedition has been dysentery, and I can boast of but few patients cured of it by medicine, though it was freely given, as we were possessed of abundance of medical stores A great drawback to their cure has been the necessity of moving on, whereas a few days' rest, in a country blessed with good water and food, would have restored many of them to health, but good water and good food combined could not be procured anywhere but here The Arabs would have taken nine months or a year to march this long distance, while we have performed it in only 103 days, including halts As I vaccinated every member of the Expedition on the coast, I am happy to say that not one has fallen a victim to small-pox.

I leave this letter in the hands of Sungoro, a Msawahili trader, who resides here, in the hope that he will be enabled shortly to forward it to Unyanyembe, as he frequently sends caravans with ivory, but a copy of it I shall take with me to Uganda, and deliver to Mtesa, the King, to be conveyed, if possible, to Colonel Gordon. Since leaving Mpwapwa I have not met one caravan bound for Zanzibar; and after leaving Ugogo it was impossible to meet one, or to despatch couriers through such dangerous countries as we have traversed. The letters containing the account of our exploration of the Victoria Niyanza and our subsequent march to the Albert Niyanza I hope to be able to deliver personally into the hands of Colonel Gordon, and in this expectation I remain, yours obediently,

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* Speke's observations on his first Expedition gave the altitude of the Lake as 3740 feet above the sea-level.—[Ed]

HENRY M. STANLEY.

P.S.—You may have observed that I have differed from Captain Speke in the spelling of Nyanza, as he calls it. I have taken the liberty of writing it as it is actually pronounced by both Arabs and natives, Ni-yanza or Nee-yanza.

March 5.—The boiling point observed by one of Negretti and Zambra's apparatus this day was 205 deg. 6 min., temperature of air, 82 deg. Fahrenheit. The boiling point observed by another instrument by a different maker was 205 deg. 5 min., temperature of air, 81 deg. Fahrenheit. The barometer at the same time indicated 26.90 inches. The mean of the barometrical observations at Zanzibar was 30.048. The mean of the barometrical observations during seven days' residence here has been 26.138.

II.

Ulagalla, Mtesa's Capital, Uganda, E. long. 32 deg. 49 min. 45 sec., N. lat. 0 deg. 32 min., April 12, 1875.*

I WRITE this letter in haste, as it is the record of a work begun, and not ended—I mean the exploration of the Victoria Niyanza. But brief as it necessarily must be, I am sure it will interest thousands of your readers, for it solves the great question, "Is the Victoria Niyanza one lake, or does it consist of a group of lakes such as Livingstone reported it?"

In answer to the query, I will begin by stating that I have explored, by means of the *Lady Alice*, nearly the whole of the Southern, Eastern, and North-Eastern shores of the Victoria Niyanza, have penetrated into every bay, inlet, and creek that indent its shores, and have taken thirty-seven observations, so that I feel competent to decide upon the question at issue, without bias or prejudice to any hypothesis. I have a mass of notes relating to the countries visited, and ample means of making a proper chart at my camp at Usukuma, but I have with me at present neither paper, parallel rules, nor any instrument whatever to lay down the positions I have taken. I only brought hither an artificial horizon, sextant, chronometer, two aneroids, boiling-point apparatus, sounding-line, a few guns, ammunition, and some provision, as I wished to keep the boat as light as possible, that she might work easily in the storms of the Niyanza. But when I reach camp I propose to draw a correct chart of the Niyanza, and to write such notes upon the several countries I have visited as will repay perusal and study.

I have already informed you that our camp at Kagehyi, in Usukuma, is situated in E. long. 33 deg. 13 min., and S. lat. 2 deg. 31 min. Before starting on the exploration of the lake I ascertained that Muanza was situated a few miles west, almost on the same parallel of latitude as Kagehyi. Now, Muanza is the point whence Speke observed the Victoria Niyanza, and where he drew his imaginary sketch of the lake from information given to him by the natives. If you will look at Speke's map you will find that it contains two islands—

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* 'Daily Telegraph,' Nov. 15, 1875.

Ukerewe and Mazita Looking at the same objects from Kagehyi, I should have concluded that they were islands myself, but a faithful exploration of the lake has proved that the latter is not insulated, but a lengthy promontory of land extending from E long 34 deg 45¾ min to E long 32 deg. 40 min 15 sec That part of the lake which Speke observed from Muanza is really a huge gulf about 25 miles wide by 65 miles long. To the noble Niyanza, discovered by him, Speke loyally gave the surname of Victoria, as a tribute to his Sovereign, which let no man take away, but in order to connect for ever Speke's name with the lake which he then found I have thought it but simple justice to the gallant explorer to call the immense inlet Speke Gulf

If you look again on Speke's map you will observe how boldly he has sketched the Niyanza stretching eastward and north-eastward. Considering that he drew it from mere native report, which never yet was exact or clear, I must say that I do not think any other man could have arrived so near the truth I must confess that I could not have done it myself, for I could make little of the vague and mythical reports of the natives of Kagehyi

Proceeding eastward towards the unknown and fabulous distance in the *Lady Alice*, with a picked crew of eleven men and a guide, I coasted along the southern shore of the lake round many a noble bay, until we came to the mouth of the Shimeeyu, in E long 33 deg 33 min, S lat 2 deg 35 min—by far the noblest river discharging into the lake which we have yet seen The Shimeeyu has a length of 370 miles, and is the extreme southern source of the Nile Before emptying into the lake it unites with the Luwamberri River, along with which it issues in a majestic flood to the Victoria Niyanza At its mouth it is a mile wide, but contracts as we proceed up the channel to 400 yards Even by itself it would make no insignificant White Nile By accident our route through Ituru took us from its birthplace, a month's march from the lake, and along many a mile of its crooked course, until by means of the *Lady Alice* we were enabled to see it enter the Niyanza, a river of considerable magnitude

Between the mouth of the Shimeeyu and Kagehyi were two districts—Sima and Magu—of the same nature as Usukuma, and inhabited by peoples speaking the same dialect On the eastern side of the river is Maganza, and beyond, Manasu

Coasting still along the southern shore of the lake, beyond Manasu, we come to Ututwa, inhabited by a people speaking a different language, namely, that of the Wajika—as the Wamanasu are called here—a people slender and tall, carrying formidably long knives and terribly portentous spears In E. long. 33 deg 45 min 45 sec we sailed to the extreme end of Speke Gulf, and then turned northward as far as S lat 2 deg. 5 min., whence we proceeded westward almost in a straight line along Shahshi and Uramba, in Ukerewe In E long. 33 deg. 26 min we came to a strait—the Rugeshi Strait—which separates one half of Ukerewe from the other half, and by which there is a direct means of communication from Speke Gulf with the countries lying north of Ukerewe. We did not pass through, but proceeded still westward, hugging the bold shores of that part of Ukerewe, which is an island, as far as E. long 32 deg. 40 min 15 sec., whence, following the land, we turned north-west, thence north, until in S. lat. 1 deg. 53 min., we turned east again, coasting along the northern shores of Ukerewe Island until we came to the tabular-topped bluff of Majita (Speke miscalled this Mazita, or Maziti, and termed it an island), in E. long. 33 deg 9 min. 45 sec, and S lat 1 deg 50 min, whence the land starts by trending northward of east. North of Shizu in Ukerewe lies the large island of Ukara, which gives its name with some natives to that part of the lake lying between it and Ukerewe It is about 18 miles long by 12 wide, and is inhabited by a people strong in charms and magic medicine.

From Majita we pass on again to the north shore of Shahshi, whose south coast is bounded by Speke Gulf, and beyond Shahshi we come to the first district in Ururi. Ururi extends from Shahshi in s lat 1 deg 50 min., to 0 deg 40 min s., and embraces the districts of Wyi, Irieni, Urieri, Igengi, Utiri, Shirati, and Mohuru. Its coast is indented most remarkably with bays and creeks, which extend far inland. East of the immediate coast-line the country is a level plain which is drained by an important river, called Shirati. All other streams that issue into the lake along the coast of Ururi are insignificant.

North of Shirati, the most northern district of Ururi, begins the country of Ugeyeya, whose bold and mountainous shores form a strong contrast to the flats of Shirati and Mohuru. Here are mountains rising abruptly from the lake to a height of 3000 feet and more. This coast is also very crooked and irregular, requiring patient and laborious rowing to investigate its many bends and curves. The people are a timid and suspicious race, much vexed by their neighbours, the Waruri, south, and Wamasai, east, and are loth to talk to strangers, as the Arab slave-dealers of Pangani have not taught them to love people carrying guns. The Wageyeya, having been troubled by the Waruri, have left many miles of wilderness uninhabited between their country and that of their fierce neighbours. But Sungoro, the agent of Mse Saba—who has prompted the Waruri to many a devilish act, and purchased their human spoils—is constructing in Ukerewe a dhow of twenty or thirty tons burden, with which he intends to prosecute more actively his nefarious trade. Nothing would have pleased me better than to have been commissioned by some Government to hang all such wretches wherever found, and if ever a pirate deserved death for inhuman crimes, Sungoro, the slave-trader, deserves death. Kagehyi, in Usukuma, has become the seat of that inhuman slave-trade. To that part they are collected from Sima, Magu, Ukerewe, Ururi, and Ugeyeya, and when Sungoro has floated his dhow and hoisted his blood-stained ensign, the great sin will increase tenfold, and the caravan-road to Unyanyembe will become hell's highway.

On the coast of Ugeyeya I expected to discover a channel to another lake, as there might be a grain of truth in what the Wanguana reported to Livingstone, but I found nothing of the sort except unusually deep bends in the shore, which led nowhere. The streams were insignificant, and undeserving the name of rivers.

A few miles from the equator I came upon two islands formed of basaltic rock, and overgrown with a dense growth of tropical vegetation. One had a natural bridge of rock 30 feet long and 15 feet wide, the other showed a small cave.

In E longitude 34 deg 49 min, at Nakidimo of Ugeyeya, we came to the furthest point east of the Victoria Niyanza. North of Ugeyeya begins Baringo, a limited country extending over about 15 miles of latitude. Its coast is also remarkable for deep indentations and noble bays, some of which are almost entirely closed by land, and might well be called lakes by uncultivated or vague Waganda. Large islands also are numerous, some of which lie so close to the shore-line that if we had not hugged its edge closely we should have mistaken them for portions of the mainland. North of Baringo the land is again distinguished by lofty hills, cones, and plateaus which sink eastward into plains, and here a new country commences—Unyara—the language of whose people is totally distinct from that of Usukuma, and approaches to that of Uganda and Usoga. Unyara occupies the north-eastern coast of the Victoria Niyanza, and by observation the extreme north-eastern point of the Niyanza ends in E. long 34 deg. 35 min, and N lat. 33 min 43 sec. As I intend to send you a chart of the Niyanza, it is needless here to enter into minor details, but I may as well mention that a large portion of the north-eastern end of the lake is almost entirely closed in by the shores of Ugana and of two islands, Chaga and Usuguru, the latter of which is one of the largest in the Niyanza While Unyara occupies the north-eastern coast of the Victorian Sea, Ugana commences the northern coast of the lake from the east, and running south-west a few miles forms here a large bay. It then trends westward, and the island of Chaga * runs directly north and south for 8 miles, at a distance of 12 miles from the opposite coast of Unyara With but a narrow channel between, Usuguru Island runs from the southern extremity of Chaga, in a south-south-easterly direction, to within 6 miles from the eastern shore of the mainland Thus hereabouts almost a lake is formed separate from the Niyanza

North of Chaga Island, Usoga begins with the large district of Usowa, where we met with the first hostile demonstration—though not actual deed, as the act was checked by show of superior weapons—on the part of the natives. Thence as we proceed westward, the districts of Ugamba, Uvira, Usamu, and Utambi, line the coast of Usoga Where Utambi begins, large islands again become frequent, the principal of which is Uvuma, an independent country, and the largest in the Victoria Niyanza At Uvuma, we experienced treachery and hostility on the part of the natives By show of friendship on their part, we were induced to pass within a few yards of the shore, where a mass of natives were hid in ambush behind the trees While sailing quietly by, exchanging friendly greetings with them, we were suddenly attacked with a shower of large rocks, several of which struck the boat, but the helm being quickly put "hard up," we sheered from shore to a safer distance, but not before the foremost of the rascals had to be laid dead by a shot from one of my revolvers

After proceeding some miles we entered a channel between the islands of Uvuma and Bugeyeya, but close to the shore of Uvuma Here we discovered a fleet of large canoes—thirteen in number—carrying over a hundred warriors, armed with shields, spears, and slings The foremost canoe contained baskets of sweet potatoes, which the people held up, as if they were desirous to trade I ordered my party to cease rowing, and as there was but a slight breeze we still held on with the sail, and permitted the canoe to approach While we were bargaining for potatoes with this party the other canoes came up and blocked the boat, while the people began to lay surreptitious hands on everything, but we found their purpose out, and I warned the robbers away with my gun They jeered at this, and immediately seized their spears and shields, while one canoe hastened away with some beads its crew had stolen, and which a man insolently held up to my view, mockingly inviting us to catch him At the dangerous example of this I fired, and the man fell dead in his place The others prepared to launch their spears, but the repeating rifle was too much for the crowd of so-called warriors, who had hastened like pirates to pillage us Three were shot dead, and as they retreated my elephant rifle smashed their canoes, the results of which we saw in the confusion attending each discharge After a few rounds from the big gun we continued on our way, still hugging the shore of Uvuma, for it was unnecessary to fly after such an exhibition of inglorious conduct on the part of thirteen canoes, containing in the aggregate over one hundred men

In the evening we anchored in the channel between Uvuma and Usoga, in E long 33 deg 40 min 15 sec., and N lat 0 deg. 30 min. 9 sec. Next morning, the current perceptibly growing stronger as we advanced north, we entered the Napoleon Channel, which separates Usoga from Uganda, and then sailed across to the Uganda shore. Having arrived close to the land, we took in all sail and rowed towards the Ripon Falls, the noise of whose rushing

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* Mr Stanley, in his letter of 15th May, refers to this as a promontory, it is also so shown in the map which he has forwarded —[ED]

waters sounded loud and clear in our ears The lake shoaled rapidly, and we halted to survey the scene at a spot half a mile from the first mass of foam caused by the escaping waters Speke has been most accurate in his description of the outflowing river, and his pencil has done fair justice to it. The scenery around, on the Usoga and the Uganda side, has nothing indeed of the sublime about it, but it is picturesque and well worthy a visit A few small islets dot the channel and lie close ashore, while at the entrance of the main channel, looking south, the large islands of Uziri and Wanzi stretch obliquely, or south-west towards Uvuma But the eye of the observer is more fascinated by the ranks of swelling foam and leaping waters than by the uneven contour of the land, and the ear is attracted by the rough music of the river's fierce play, despite the terrors which the imagination paints, so that it absorbs all our attention to watch the smooth, flowing surface of the lake, suddenly broken into fury by the rocks of gneiss and hematite which protrude, white and ruddy, above the water, and which threaten instant doom to the unlucky navigator who should be drifted among them There is a charm, too, in the scene which can belong to few such, for this outflowing river that the Great Victoria Niyanza discharges from its bosom, becomes known to the world as the White Nile. Though born amid the mountains of Ituru, Karague, and Ugeyeya, it emerges from the womb of the Niyanza, the perfect and veritable Nile which annually resuscitates parched Egypt.

From the Ripon Falls we proceeded along the coast of Ikira south-west, until, gaining the shore opposite Uziri, we coasted westerly along the irregular shore of Uganda Arriving at the isle of Kiwa, we secured guides, who voluntarily offered to conduct us as far as Mtesa's capital Halting a short time at the island of Kibibi, we proceeded to Ukafu, where a snug horseshoe-shaped bay was discovered From Ukafu we despatched messengers to Mtesa to announce the arrival of a white visitor in Uganda, after being most hospitably received with fair words, but with empty hands, along the coast of Uganda I was anxious to discover the entrance of the "Luajerri," and questioned the natives long and frequently about it, until, securing an interpreter who understood the Kisawahili, we ascertained that there was no such river at all as the Luajerri, that "Luaserri," nowever, meant *still water*, applicable to any of the many lengthy creeks or narrow inlets which indent the coasts of Uganda and Usoga From this I conclude that Speke was misinformed, and that his "Luajerri" is Luaserri, or a still water At least we discovered no such river, either sluggish or quick, flowing northwards, while in the neighbourhood of "Murchison Creek" I did, indeed, find a long and crooked inlet called Mwaru-Luaserri, or The Quiet-water, which penetrated several miles inland, and the termination of which we saw I noticed a positive tide here, I should mention, during the morning For two hours the water of this creek flowed north, and subsequently for two hours it flowed south, while on asking the people if this were a usual sight they said it was, and was visible in all of the inlets on the coast of Uganda

Arriving at Beyal we were welcomed by a fleet of canoes sent by Mtesa to conduct us to "Murchison Creek," and on the 4th of April I landed amid a concourse of two thousand people, who saluted me with a deafening volley of musketry and waving of flags. Katakiro, the chief Mukungu, or officer, in Uganda, then conducted me to comfortable quarters, to which shortly afterwards were brought sixteen goats, ten oxen, an immense quantity of bananas, plantains, sweet potatoes, besides eggs, chickens, milk, rice, ghee, and butter. After such a royal and bountiful gift I felt more curiosity than ever to see the generous monarch; and in the afternoon Mtesa, having prepared beforehand for my reception, sent to say that he was ready to welcome me Issuing out of my quarters I found myself in a broad street, 80 feet wide and half a mile long, which was lined by his personal guards and attendants, his captains and their respective retinues, to the number of about three thousand. At the extreme end of this street, and fronting it, was the King's audience-house, in whose shadow I saw dimly the figure of the King sitting in a chair As I advanced towards him the soldiers continued to fire their guns The drums, sixteen in number, beat out a fearful tempest of sound, and the flags waved, until I became conscious that all this display was far beyond my merits, and consequently felt greatly embarrassed by so flattering a reception Arrived before the audience-house, the King rose—a tall and slender figure, dressed in Arab costume—approached me a few paces, held out his hand mutely, while the drums continued their terrible noise, and we stood silently gazing at each other during a few minutes—I, indeed, more embarrassed than ever But, soon relieved from the oppressive noise of the huge drums and the hospitable violence of the many screaming discordant fifes, I was invited to sit, Mtesa first showing the example, followed by his great captains, about one hundred in number.

More at ease, I now surveyed the figure and features of this powerful monarch Mtesa is about thirty-four years old, and tall and slender in build, as I have already stated, but with broad shoulders His face is very agreeable and pleasant, and indicates intelligence and mildness His eyes are large, his nose and mouth are a great improvement upon those of the common type of negro, and approach to the same features in the Muscat Arab when slightly tainted with negro blood His teeth are splendid, and gleaming white

As soon as Mtesa began to speak I became captivated by his manner, for there was much of the polish of a true gentleman about it—it was at once amiable, graceful, and friendly It tended to assure me that in this potentate I had found a friend, a generous King, and an intelligent ruler He is not personally inferior to Seyd Burghash, the Arab Sultan of Zanzibar, and, indeed, appears to me quite like a coloured gentleman who has visited European Courts, and caught a certain refinement and ease of manner, with a large amount of information If you will recollect, however, that Mtesa is a native of Central Africa, and that he had seen but three white men until I came, you will, perhaps, be as much astonished at all this as I was And if you will but think of the enormous extent of country he rules—extending from E long 34° to 31°, and from N lat 1° to S lat. 3° 30′, you will further perceive the immense influence he could wield towards the civilisation of Africa Indeed, I could not regard this King or look at him in any other light than as the possible Ethelbert, by whose means the light of the Gospel may be brought to benighted Middle Africa Undoubtedly the Mtesa of to-day is vastly superior to the vain youth whom Speke and Grant saw There is now no daily butchery of men or women, seldom one suffers the extreme punishment Speke and Grant left him a raw, vain youth, and a heathen He is now a gentleman, and, professing Islamism, submits to other laws than his own erratic will, which, we are told, led to such severe and fatal consequences All his captains and chief officers observe the same creed, dress in Arab costume, and in other ways affect Arab customs He has a guard of 200 men—renegadoes from Baker's Expedition,* Zanzibar defalcators, a few Omani, and the elect of Uganda Behind his throne, an arm-chair of native manufacture, the royal shield-bearers, lance-bearers, and gun-bearers stand erect and staid. On either side of him are his grand chiefs and courtiers, sons of governors of his provinces, chiefs of districts, &c Outside the audience-house the lengthy lines of warriors begin with the chief drummer and the noisy goma-beaters, next come the screaming fifers, the flag and banner-bearers, the fusiliers, and so on, seemingly *ad infinitum*, with spearmen and attendants

Mtesa asked a number of questions about various things, thereby showing a vast amount of curiosity and great intelligence. The King had arrived at this camp—Usavara—fourteen days before my arrival, with all that immense army of followers, for the purpose of shooting birds He now proposed to return, after two or three days' rest, to his capital at Ulagalla, or Uragara Each day of my stay at Usavara was a scene of gaiety and rejoicing On the first after my arrival we beheld a grand naval review, eighty-four canoes being under way, each manned by from thirty to forty men, containing in the aggregate a force of about 2500 men We had excellent races, and witnessed various manœuvres by water Each admiral vied with the others in extolling aloud the glory of their monarch, or in exciting admiration from the hundreds of spectators on shore The King's 300 wives were present *en grande tenue*, and were not the least important of those on shore The second day the King led his fleet in person, to show me his prowess in shooting birds We rowed, or were rather paddled, up "Murchison Creek," visiting *en route* a dhow he is building for the navigation of the lake, as well as his place of residence during Ramadan, and his former capital "Banda," where Speke and Grant found him

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* See Sir S Baker's remarks on this subject, 'Proceedings,' vol xx, p. 48.

En passant, I may remark that Speke could not possibly have seen the whole of the immense bay he has denominated "Creek" It is true that from a short distance west of Dwaga, the King's Ramadan palace, up to Mgono, the extremity of the water, a distance of about 8 miles, it might be termed a creek, but this distance does not approach to one-half of the true bay Indeed, I respectfully request geographers—Messrs Keith Johnston and Stanford especially—to change the name of Murchison Creek to Murchison Bay, as one more worthy the large area of water now known by the former inappreciative title Murchison Bay extends from N lat 0 deg. 15 min to N lat 0 deg 27 min, and from E long 32 deg 53 min to 32 deg 38 min in extreme length At the mouth the bay contracts to a width of 4 miles, but within its greatest breadth is 12 miles Surely such a body of water—as terms go—deserves the more appropriate name of "bay," but I leave it to fair-judging geographers to decide For the position of Mtesa's capital I have taken three observations, on three different days My longitude agrees pretty closely with that of Speke's, while there is but 4 miles' difference of latitude

The third day the troops of Mtesa were exercised at target practice, and on the fourth we all marched for the Grand Capital, the Kibuga of Uganda, Ulagalla or Uragara Mtesa is a great king He is a monarch who would delight the soul of any intelligent European, as he would see in his black Majesty the Hope of Central Africa He is King of Karague, Uganda, Unyoro, Usoga, and Usui Each day I found something which increased my esteem and respect for him He is fond of imitating Europeans and what he has heard of their great personages, which trait, with a little tuition, would prove of immense benefit to his country He has prepared broad highways in the neighbourhood of his capital for the good time that is coming when some charitable European will send him any kind of a wheeled vehicle As we approached the capital the main road from Usavara increased in width from 20 feet to 150 feet When we arrived at this magnificent breadth we viewed the capital crowning an eminence commanding a most extensive view of a picturesque and rich country, all teeming with gardens of plantains and bananas, and beautiful pasture-land Of course, huts, however large, lend but little attraction to a scene, but a tall flagstaff and an immense flag proved a decided feature in the landscape Arrived at the capital, I found that the vast collection of buildings crowning the eminence were the royal quarters, round which ran five several palisades and circular courts, between which and the city was a circular road, ranging from 100 to 200 feet in width, and from this radiated six or seven imposing avenues, lined with gardens and huts.

The next day after arrival I was introduced to the royal palace in great state None of the primitive scenes visible in Speke's book was now visible there. The guards, clothed in white cotton dresses, were by no means comical as then. The chiefs were very respectable-looking people, dressed richly in the Arab costume. The palace was a huge and lofty structure, well built of grass and cane, while tall trunks of trees upheld the roof, which was covered with cloth sheeting inside.

On the fourth day after my arrival, news came that another white man was approaching the capital from the direction of Unyoro, and on the fifth day I had the extreme pleasure of greeting Colonel Linant de Bellefonds, of the Egyptian service, who had been despatched by Colonel Gordon to Mtesa, to make a treaty of commerce between him and the Egyptian Government. The rencontre, though not so exciting as my former meeting with the venerable David Livingstone at Ujiji, in November, 1871, still may be said to be singular and fortunate for all concerned. In Colonel de Bellefonds I met a gentleman extremely well-informed, energetic, and a great traveller. His knowledge of the countries between Uganda and Khartoum was most minute and accurate, from which I conclude that but little of the geography of Central Africa between the cataracts of the Nile and Uganda is now unknown. To that store of valuable geographical acquisitions must now be added my exploration of the Nile Sources which pour into the Niyanza, and also the new countries I have visited between the Niyanza and the Unyanyembe Road. In Colonel de Bellefonds' arrival I also perceived my great good fortune, for I now had the means to despatch some reports of my geographical discoveries, and the long-delayed letters.

The day after to-morrow I intend to return to Usukuma, prosecuting my geographical researches along the western shore of the Victoria Niyanza. After this I propose to march the Expedition to the Katonga Valley, and thence, having paid another visit to Mtesa, I trust to march directly west for Lake Albert Niyanza, where I hope to meet with some more of the gallant subordinates of Colonel Gordon, by whom I shall be able, through their assured courtesy, to send several more letters descriptive of discoveries and adventures.

I might protract this letter indefinitely by dwelling upon the value of the services rendered to science and the world by Ismail Pasha, but time will not allow me, nor, indeed, is it necessary, as I dare say by this time you have had ample proofs of what has been done by Gordon. Sir Samuel Baker, unfortunately, appears to be in bad odour with all I meet. His severity and other acts receive universal condemnation; but far be it from me to add to the ill report, and so I leave what I have heard untold.

Then, briefly, thus much remains to be said. Livingstone, in his report of the Niyanza consisting of five lakes, was wrong. Speke, in his statement that the Niyanza was but one lake, was quite correct. But I believe that east of the Niyanza, or rather north-east of its coasts, there are other lakes, though they have no connection whatever with the Niyanza, nor do I suppose they can be of any great magnitude, or extend south of the Equator. If you ask me why, I can only answer that in my opinion the rivers entering the Victorian Sea on the north-eastern shore do not sufficiently drain the vast area of country lying between the Great Lake and the western versant of the East-African mountain range. From the volume of the Niyanza feeders on the north-eastern side I cannot think that they extend farther than E. long 36 deg., which leaves a large tract of country eastward to be drained by other means than the Niyanza. But this means may very probably be the Jub, which empties its waters into the Indian Ocean. The Sobat cannot possibly approach near the Equator; this, however, will be decided definitively by Gordon's officers. Colonel de Bellefonds informs me that the Assua, or Asha, is a mere torrent.

When you see my chart, which will trace the course of the Luamberri and the Shimeeyu, the rivers which drain the whole of the south and south-east countries of the Niyanza, you will be better able to judge of their importance and magnitude as sources of the Nile I expect to come upon a considerable river south-west, but all of this will be best told in my next letter.

HENRY M STANLEY

P S —I had almost forgotten to state that the greatest depth of the Niyanza as yet ascertained by me is 275 feet I have not yet sounded the centre of the lake, this I intend to do on my return to Usukuma south.

Mtesa's Capital, Uganda, April 14, 1875

I MUST not forget to inform you and your readers of one very interesting subject connected with Mtesa, which will gratify many a philanthropic European and American

I have already told you that Mtesa and the whole of his Court profess Islamism A long time ago—some four or five years—Khamis Bin Abdullah (the only Arab who remained with me three years ago, as a rearguard, when the Arabs disgracefully fled from Mirambo) came to Uganda He was wealthy, of noble descent, had a fine, magnificent personal appearance, and brought with him many a rich present for Mtesa, such as few Arabs could afford The King became immediately fascinated with him, and really few white men could be long with the son of Abdullah without being charmed by his presence, his handsome, proud features, his rich olive complexion, and his liberality I confess I never saw an Arab or Mussulman who attracted me so much as Khamis bin Abdullah, and it is no wonder that Mtesa, meeting a kindred spirit in the noble youth of Muscat, amazed at his handsome bearing, the splendour of his apparel, the display of his wealth, and the number of his slaves, fell in love with him Khamis stayed with Mtesa a full year, during which time the King became a convert to the creed of his visitor—namely, Mohammedanism The Arab clothed Mtesa in the best that his wardrobe offered, he gave him gold-embroidered jackets, fine white shirts, crimson slippers, swords, silk sashes, daggers, and a revolving rifle, so that Speke and Grant's presents seemed of necessity insignificant. Now, until I arrived at Mtesa's Court, the King delighted in the idea that he was a follower of Islam, but by one conversation I flatter myself that I have tumbled the newly-raised religious fabric to the ground, and if it were only followed by the arrival of a Christian mission here, the conversion of Mtesa and his Court to Christianity would, I think, be complete I have, indeed, undermined Islamism so much here, that Mtesa has determined henceforth, until he is better informed, to observe the Christian Sabbath as well as the Moslem Sabbath, and the great captains have unanimously consented to this. He has further caused the Ten Commandments of Moses to be written on a board for his daily perusal—for Mtesa can read Arabic—as well as the Lord's Prayer, and the golden commandment of our Saviour, "Thou shalt love thy neighbour as thyself" This is great progress for the few days that I have remained with him, and, though I am no missionary, I shall begin to think that I might become one if such success is feasible But, oh that some pious, practical missionary would come here! What a field and a harvest ripe for the sickle of civilisation! Mtesa would give him everything he desired—houses, lands, cattle, ivory, &c, he might call a province his own in one day It is not the mere preacher, however, that is wanted here The Bishops of Great Britain collected, and all the classic youth of Oxford and Cambridge, would effect nothing by mere talk with the intelligent people of Uganda. It is the practical Christian tutor, who can teach people how to become Christians, cure their diseases, construct dwellings, understand and exemplify agriculture, and turn his hand to anything like a sailor—this is the man who is wanted. Such an one, if he can be found, would become the saviour of Africa. He must be tied to no church or sect, but profess God and His Son and the moral law, and live a blameless Christian, inspired by liberal principles, charity to all men, and devout faith in Heaven. He must belong to no nation in particular, but the entire white race. Such a man or men, Mtesa, King of Uganda, Usoga, Unyoro, and Karague—a kingdom 360 geographical miles in length by 50 in breadth—invites to repair to him. He has begged me to tell the white men that if they will only come to him he will give them all they want. Now, where is there in all the pagan world a more promising field for a mission than Uganda? Colonel Linant de Bellefonds is my witness that I speak the truth, and I know he will corroborate all I say. The Colonel, though a Frenchman, is a Calvinist, and has become as ardent a well-wisher for the Waganda as I am. Then why further spend needlessly vast sums upon black pagans of Africa who have no example of their own people becoming Christians before them? I speak to the Universities Mission at Zanzibar and to the Free Methodists at Mombasa, to the leading philanthropists, and the pious people of England. Here, gentlemen, is your opportunity—embrace it! The people on the shores of the Niyanza call upon you. Obey your own generous instincts, and listen to them, and I assure you that in one year you will have more converts to Christianity than all other missionaries united can muster. The population of Mtesa's kingdom is very dense, I estimate the number of his subjects at 2,000,000. You need not fear to spend money upon such a mission, as Mtesa is sole ruler, and will repay its cost tenfold with ivory, coffee, otter-skins of a very fine quality, or even in cattle, for the wealth of this country in all these products is immense. The road here is by the Nile, or *viâ* Zanzibar, Ugogo, and Unyanyembe. The former route, so long as Colonel Gordon governs the countries of the Upper Nile, seems the most feasible.

With all deference I would suggest that the mission should bring to Mtesa as presents, three or four suits of military clothes, decorated freely with gold embroidery, together with half-a-dozen French *kepis*, a sabre, a brace of pistols, and suitable ammunition, a good fowling-piece and rifle of good quality, for the King is not a barbarian, a cheap dinner-service of Britannia ware, an iron bedstead and counterpanes, a few pieces of cotton print, boots, &c. For trade it should also bring fine blue, black, and grey woollen cloths, a quantity of military buttons, gold braid and cord, silk cord of different colours, as well as binding, linen and sheeting for shirts, fine red blankets and a quantity of red cloth, with a few chairs and tables. The profit arising from the sale of these things would be enormous.

For the mission's use it should bring with it a supply of hammers, saws, augers, chisels, axes, hatchets, adzes, carpenters' and blacksmiths' tools, since the Waganda are apt pupils, iron drills and powder for blasting purposes, trowels, a couple of good-sized anvils, a forge and bellows, an assortment of nails and tacks, a plough, spades, shovels, pickaxes, and a couple of light buggies as specimens, with such other small things as their own common sense would suggest to the men whom I invite. Most desirable would be an assortment of garden seed and grain; also white-lead, linseed-oil, brushes, a few volumes of illustrated journals, gaudy prints, a magic lantern, rockets, and a photographic apparatus. The total cost of the whole equipment need not exceed 5000*l*. sterling.

HENRY M. STANLEY.

III

Village of Kagehyi, District of Uchambi, Country of Usukuma,
May 15, 1875 *

By the aid of the enclosed map you will be able to understand the positions and places of the countries mentioned in my last, and of some which I shall be obliged to describe in this letter It is needless to go over the same ground I described in my letter from Uganda, but since I send you a map it will be no labour lost again to sketch briefly the characteristics of the countries lying east between Usukuma and Uganda

Between the district of Uchambi, which is in Usukuma, and the Shimeeyu River, the principal affluent of the Niyanza, lie the pretty districts of Sima and Magu, governed by independent chiefs On the eastern side of the Shimeeyu is Maganza, a rugged and hilly country thinly populated and the resort of the elephant-hunters Beyond Maganza the coast is formed by Manasu, a country similar in feature to Maganza, abounding in elephants This extends to the eastern extremity of Speke Gulf, when we behold a complete change in the landscape The land suddenly sinks down into a flat marshy country, as if Speke Gulf formerly had extended many miles inland, and I have little doubt, but rather feel convinced, it did

This country is called Wiregedi, peopled by savages who have little or no intercourse with Usukuma, but are mostly morosely exclusive and disposed to take advantage of their strength to rob strangers who visit them Wiregedi is drained by the Ruana, which discharges itself into Speke Gulf by two mouths It is a powerful stream, conveying a vast quantity of water to the gulf, but in importance not to be mentioned in the same category as the Shimeeyu and the Kagera, the two principal affluents of Lake Victoria Speke Gulf at its eastern extremity is about 12 miles in width Opposed to the hilly ranges of Manasu and Maganza are the sterile naked mountains and plains of Shahshi, Uramba, and Ururi. The plains which separate each from the other are as devoid of vegetation as the Isthmus of Suez, a thin line only, bordering the lake, is green with bush and cane The gulf, as we proceed west from Ururi, is shored by the great island of Ukerewe, a country blessed with verdure and plenty, and rich in herds of cattle and ivory. A narrow strait, called the Rugeshi, separates Ukerewe from Urirwi The Wakereweh are an enterprising and commercial people, and the King, Lukongeh, is a most amiable man. The Wakereweh possess numerous islands—Nifuah, Wezi, Irangara, Kamassi, &c, are all inhabited by them Their canoes are seen along Ugeyeya, Usongora, and Uzinza, and to the tribes in the far interior they have given, by their activity and commercial fellowship, a name to the entire Victoria Niyanza

Rounding Ukerewe, we pass on our left the island of Ukara, and, sailing past Shizu and Kiveru, come to the northern end of Rugeshi Strait, from which we see the towering table mountain of Majita, or Mazita, a little to the north-east of us, the mountains of Urirwi and Uramba rising in our front I mentioned to you in one of my letters that Speke described Majita as an island, and that I, standing on the same spot, would do so likewise, if I had no other proof than my own conjecture. As we approach Majita we see the reason of this delusion. The table mountain of Majita is about 3000 feet in altitude above the lake, while on all sides of it, except the lake side at its base, are low brown plains which rise but a few feet above the water. It is the same case with Urirwi, Uramba, and Shahshi. At a distance I thought them islands, until I arrived close upon them On the northern side of this eminence the brown plain extends far inland, and I do believe a great plain

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* 'Daily Telegraph,' Oct 18, 1875

or a series of plains bounds the lake countries east, for we have similar landscapes, distant or near, everywhere In endeavouring to measure the extent of this plain I am compelled to think of Ugogo, for as we traversed its northern frontier we saw each day stretching north the barren thorn-covered plain of Uhumba On leaving Iramba we came again in view of a portion of it, more recently covered with water, under the name of the Luwamberri Plain. As we journeyed through Usmaow we saw from many a ridge the plain extending north That part of the plain lying between Urimi and the lake is, of course, drained by the Luwamberri, the Monunguh, and the Duma rivers, and discharged into the Niyanza under the name of the Shimeeyu But north-east of the Shimeeyu's mouth imagine the land heaved into a low, broad, and lengthy ridge, forming another basin drained by the Ruana, and still another drained by the Mara, and again another by the Mori, &c If we ask the natives what lies beyond the immediate lake lands, we are assured unhesitatingly, "Mbuiga tu," "Only a plain "

From Majita north we sail along the coast of Ururi, a country remarkable for its wealth of cattle and fine pastoral lands It is divided into several districts, whose names you will find marked on the map Mohuru and Shirati, low, flat, and wooded districts of Ururi, separate this country from Ugeyeya, the land of so many fables and wonders, the Eldorado of ivory seekers, and the source of wealth for slave-hunters

Our first view of it while we cross the Bay of Kavirondo is of a series of tall mountains, and of a mountainous projection, which latter from a distance we take to be a promontory, but which on a nearer view turns out to be an island, bearing a tall mountain on its back At the north-eastern extremity of this bay is Gori River, which rises north-east near Kavi—no important stream, but one that grows during the rainy season to large breadth and depth Far east beyond the Niyanza for twenty-five days' march the country is here said to be one continuous plain, low hills rising now and again dotting the surface, a scrubby land, though well adapted for pasture and cattle, of which the natives possess vast herds About fifteen days' march east the people report a region wherein low hills spout smoke, and sometimes fire This wonderful district is called Susa, and is situated in the Masai Land. All combine in saying that no stream runs north, but that all waters come into the Niyanza—for at least twenty days' march Beyond this distance the natives report a small lake, from which issues a stream flowing towards the (?) Pangani

Continuing on our way north we pass between the island Ugingo and the gigantic mountains of Ugeyeya, at whose base the *Lady Alice* seems to crawl like a tiny insect, while we on board admire the stupendous summits, and wonder at the deathly silence which prevails in this solitude, where the boisterous winds are hushed, and the turbulent waves are as tranquil as a summer's dream The natives as they pass regard this spot with superstition, as well they may, for the silent majesty of those dumb tall mountains awes the very storms to peace. Let the tempests bluster as they may on the spacious main beyond this cape, in this nook, sheltered by tall Ugingo isle and lofty Goshi on the mainland, they inspire no fear. It is this pleasant refuge which Goshi promises the distressed canoe-men that causes them to sing praises of the bold headland, and to cheer one another when wearied and benighted, with the cry that "Goshi is near to protect them "

Sailing between and out from among the clustering islands, we leave Wategi behind, and steer towards two low isolated islands not far from the mainland, for a quiet night's rest; and there under the overspreading branches of a mangrove-tree we dream of unquiet waters and angry surfs and threatening rocks, to find ourselves next morning tied to an islet which, from its peculiarity, I have named Bridge Island, though its native name is Kihwa

While seeking a road to ascend the island to take bearings, I discovered there a natural bridge of basalt, about 20 feet in length by 12 in breadth, under which the traveller might repose comfortably, and from one side see the waves lashed to fury and spending their strength on the stubborn rocks that form the foundation of the arch, while from the other he could behold his boat secure under the lee of the land resting on a serene and placid surface, and shaded by mangrove-branches from the hot sun of the Equator Its neighbour is remarkable only for a small cave, the haunt of fishermen From the summit of Bridge Island the view eastward takes in all Masari as far as Nakidimo, and discovers only a flat and slightly wooded district, varied at intervals by isolated cones, while northward, at the distance of 20 miles or so, we remark that the land makes a bold and long stretch eastward Knowing now, however, by experience, that the appearance of the coast is deceptive, we hoist our sail, and scud merrily before a freshening breeze, by-and-by hugging the coast again, lest it should rob us of some rarity or wonder

At noon I found myself under the Equator, and 4 miles north I came to discoloured water and a slight current flowing south of west Seeing a small bay of sufficient breadth to make a great river, and no land at its eastern extremity, I made sure I had discovered a river which would rival the Shimeeyu, but within an hour land all round revealed the limit and extent of the Bay of Nakidimo. We anchored close to a village, and began to court the attention of some wild-looking fishermen, but the nude barbarians merely stared at us from under penthouses of hair, and hastily stole away to tell their wives and relatives of how suddenly an apparition in the shape of a boat with white wings had come before them, bearing strange men with red caps on their heads, except one—a pale-skinned man, clad in white, whose face was as red as blood—and he, jabbering something unintelligible, so frightened them that they ran away This will become a pleasant tradition, one added to the many marvels now told in Ugeyeya, which, with the art of embellishment inherent in the tongue of the wondering, awestruck savage, may grow in time to be the most wonderful of all wonders

Perceiving that our proffered courtesies were thus rudely rejected, we also stole out of the snug bay, and passed round to another much larger and more important. At its extremity a river issued into the bight, which, by long and patient talk with the timid natives, we ascertained to be the Ugoweh. In this the hippos were as bold as the human savages were timid, and to a couple of the amphibious monsters we had to induce the *Lady Alice* to show lighter heels in retreat than even the savages of Nakidimo had shown to us These hippopotami would afford rare sport in a boat specially built for killing them, then they might splinter her sides with their tusks, and bellow and kick to their utmost, but the *Lady Alice*, if I can help it, with her delicate skin of cedar and ribs of slender hickory, shall never come in close contact with the iron-hard ivory of the rude hippopotamus, for she would be splintered into matches and crushed up like an egg before one could say a word, and then the hungry crocodiles would leisurely digest us The explorer's task, to my mind, is a far nobler one than hunting sea-horses, and our gallant cedar boat has many a thousand miles to travel yet before she has performed her task The still unknown expanse of the Victoria Niyanza, northward and westward and again south-westward, still invited us and her to view its delights and wonders of Nature. The stormy Lake Albert, and the stormier Tanganyika, though yet distant, woo us to ride on their waves, and far Bangweolo, Moero, and Kamolondo with the Lincoln Lakes promise us fair prospects and as rich rewards, if we can only bide the buffets of the tempests, the fevers of the swamp and forest, and the brunt of savage hostility and ignorance till then Shall we forego the vantage of all this rich harvest and acquisition of knowledge for an hour's fierce pleasure with the ugly but formidable hippopotamus?

Not by my election or consent. Let the admirers of "sport at any price" call it faintheartedness, or even a harsher name, if they will, I call it prudence. Yet I have for them an adventure with a river-horse—a cowardly, dull-witted, fat-brained hippo—I can abuse him savagely in your columns—for his brothers in Europe, thank Fortune, do not read 'The Telegraph' or the 'Herald'—without fear of a civil or criminal suit for libel—I say I have a story of one to tell some day, when I have no higher things to write of, which will warm all your young bloods, and I have had another interview with a lion, or I might put it, a herd of lions, just as exciting But these must remain untold until I camp under the palms of Ujiji again, with half my work done, and my other half still beckoning me forward Let us pass on, therefore, to our subject, and the place where I left off—namely, cowardlike running away from a pair of bull hippos I am not certain they were bulls either, though they were big ones, sure enough

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We flew away with a bellying sail along the coast of Mahata, where we saw such a dense population and clusters of large villages as we had not beheld elsewhere We thought we would make one more effort to learn of the natives the names of some of these villages, and for that purpose steered for a cove on the western shore of Mahata We anchored within 50 yards of the shore, and so paid out our cable that but a few feet of deep water separated us from the beach Some half-a-dozen men wearing small land-shells above their elbows, and a circle of them round their heads, came to the brink With these we opened a friendly conversation, during which they disclosed the name of the country as "Mahata" or "Maheta," in Ugeyeya, more they would not communicate until we should land We prepared to do this, but the numbers on the shore increased so fast, that we were compelled to pull off again until they should moderate their excitement and make room They seemed to think we were about to pull off altogether, for suddenly appeared out of the bush on each side of the spot where we had intended to land such a host of spears, that we hoisted our sail, and left them to try their treachery on some other boat or canoe more imprudent than ours The discomfited people were seen to consult together on a small ridge behind the bush lining the lake, and no doubt they thought we were about to pass close to a small point at the north end of the cove, for they shouted gleefully at the prospect of a prize, but lowering the sail we pulled to windward, far out of the reach of bow or sling, and at dusk made for a small island to which we moored our boat, and there camped in security

Next day we continued on our course, coasted along Nduru and Manyara, and sailed into the bay which forms the north-eastern extremity of Lake Victoria Niyanza Manyara, on the eastern side of the bay, is a land of bold hills and ridges, while the very north-eastern end through which issues the Yagama River into the Niyanza is flat The opposite coast to Manyara is that of Muwanda and the promontory of Chaga, while the great slug-like island of Usuguru, standing from west to east across the mouth of the bay, shuts the bay almost entirely in. At Muwanda we again trusted our fortunes with the natives, and were this time not deceived, so that we were enabled to lay in quite a stock of vegetables and provisions at a cheap rate. They gave us all the information we desired Baringo, they said, is the name applied by the people of Ugana to Nduru, a district of Ugeyeya, and the bay on which our boat rode, the extreme end of the lake, nor did they know nor had they heard of any lake, large or small, other than the Niyanza. I have described the coast from Muwanda to Uganda, and my visit to Mtesa, together with my happy encounter with Colonel Linant de Bellefonds, of Gordon's staff, at some length, so need not go over the same ground

The day after my last letter was written, I made arrangements with the King of Uganda, by which he agreed to lend me thirty canoes and some 500 men, to convey the Expedition from Usukuma to the Katonga River. With this promise, and ten large canoes as an earnest of it, I started from Murchison Bay on April 17. We kept company as far as the Katonga River, but here the chief captain of the Waganda said that he should have to cross over to Sasse, distant 12 miles from the mainland, and the largest island in the Lake Niyanza, to procure the remaining twenty canoes promised by Mtesa. The chief gave me two canoes to accompany me, promising that I should be overtaken by the entire fleet before many days I was impatient to continue my survey of the lake and to reach Usukuma, having been so long absent from the Expedition, during which time many things contrary to my success and peace of mind might have occurred

I took my observations twice a day, with a sea horizon—one at noon for latitude, and one in the afternoon for longitude—and I am sorry to say that, if I am right, Speke is about 14 miles wrong in his latitude along the whole coast of Uganda The mouth of the Katonga River, for instance, according to his map, is a little south of the Equator I have made it by meridian altitude, observed April 20, to be in N latitude 0 deg 16 min 0 secs Thus it is nearly with all his latitudes His longitudes and mine vary but little, but this is easily accounted for The longitude of any position can be taken with a chronometer, sextant, and artificial horizon with the same accuracy on land as on sea If there is any difference it is very likely to exist in the error of the chronometers What instruments Speke possessed to obtain his latitudes I know not, but if he found the altitude of the sun ascending above 65 deg, he could never obtain it with an ordinary sextant except by double altitude, and that method is not so exact as taking a simple meridian on a quiet lake, with an ample horizon of water But there are various methods of determining one's latitude, and Speke was familiar with many. My positions all round the lake have been determined with a sea horizon When near noon my plan was, if the lake was rough, to seek the nearest island or a quiet cape at the extremity of a bay, and there take my observations as deliberately as though my life depended on their accuracy But this task was, indeed, a work of pleasure for me, and I have found a rich reward for most of my pains and stormy life on this lake in looking at the fair extent of chart-work on the blank space of my map, with all its bends, curves, inlets, creeks, bays, capes, debouchures of rivers, now surely known by the name of Victoria Niyanza Any errors which may have crept into my calculations will be determined by competent authorities on my return from Africa, or on the arrival of my papers in Europe Meantime I send my map as I have made it *

The Katonga is not a large river, and has but one mouth The Amionzi River empties itself into the Niyanza, about 8 miles W S W of the Katonga Uganda stretches to the Kagerah, situated in S lat 0 deg 40 min On the south side of the river begins Usongora, extending to S. lat 1 deg South of 1 deg is Kamiru, extending to S lat 1 deg 15 min. Thence is Uwya, with a country folk similar in enterprise to Ukerewe's people Beyond Uwya is Uzinja, or Uzinza, called by the Wanyamwezi, Mweri Uzinja continues as far south as to Jordan's Nullah, and east of it is Usukuma again, while one day's sail from Jordan's Nullah we pass Muanza, which Speke reached in 1858, and this brings us home to Kagehyi, and to our camp, where we are greeted joyfully by such as live, having, however, to mourn the poor fellows who, in our absence, have been hurried by disease to untimely graves

I must be brief in what I have to say now. I did think to make this a long letter, but Sungoro's slave, who carries it, is in a hurry to go, as his caravan has already started. My next letter must continue this from the Kagera River,

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* It will be noticed that the positions of many places on Mr Stanley's map do not agree with the latitudes and longitudes given in his letters —[ED]

called in Karague the Kitangule, and it shall describe some foul adventures that we went through, which caused us to appear in a wretched condition to our Expedition Though our condition was so wretched, it was not half so bad, nevertheless, as it would have been had we returned two days later, for I doubt much whether I should have had an Expedition to command at all. I had been absent too long, and our fight with the Wavuma had been magnified and enlarged by native rumour to such a pitch that Wolseley's victory at Ardahsu was as nothing to ours, for it had been said that we had destroyed a whole fleet of canoes, not one of which had escaped, and that some other tribe or tribes had collected a force, overtaken us, and destroyed us in like manner—an incredible story, which had, however, so won upon a faction of my soldiers, that they had determined to return to Unyanyembe, and thence to Zanzibar But God has been with us here, and on the lake, and, though we have suffered some misfortunes, He has protected us from greater ones

We had been absent from camp fifty-eight days, during which we had surveyed in our brave little boat over 1000 miles of lake shores, but a part of the south-west coast has yet to be explored We shall not leave the Niyanza, however, until we have thoroughly done our work I returned to find also that one of my two remaining white companions, Frederick Barker, of the Langham Hotel, London, had died on the 23rd April, twelve days before I reappeared at Kagehyi His disease was, as near as I can make it out from Frank Pocock's description, a congestive chill—that at least is the term applied to it in the United States Pocock calls it "cold fits"—a term every whit, I believe, as appropriate. I have known several die of these "cold fits," or aguish attacks—the preliminary symptoms of very severe attacks of intermittent fever These aguish attacks, however, sometimes kill the patient before the fever arrives which generally follows the warning The lips grow blue, the face bears the appearance of one who is frozen, the blood becomes as it were congealed, the pulse stops, and death ensues There are various methods of quickening the blood and reviving the patient, however, an excellent one is to plunge him into a vapour or hot water and mustard bath, and apply restoratives—brandy, hot tea, &c, but Pocock was not experienced in this case, though he gave Barker some brandy when first he lay down, after feeling a slight nausea and chill It appears by his comrade's report that he did not afterwards live an hour Frederick Barker suffered from one of these severe aguish attacks in Urimi, but brandy and hot tea quickly given to him soon brought him to that state which promises recovery.

Thus two out of my four white men are dead I wonder, who next? Death cries, Who next? and perhaps our several friends will sadly and kindly ask, Who next? No matter who it is We could not better ourselves by attempting to fly from this fatal land, for between us and the sea are 700 miles of as sickly a country as any in Africa The prospect is fairer in front, though there are in that direction some 3000 miles more to tramp We have, however, new and wonderful unknown tracts before us, whose marvels and mysteries shall be a medicine which will make us laugh at fever and death.

HENRY M STANLEY

NOTE on the HEIGHT of the VICTORIA NYANZA. By C. GEORGE, Staff Commander, R N, Curator, Map Department, R G S.

The great pleasure every geographer will naturally take in the new discoveries of Mr H Stanley has induced me at once to look into his observations for the height of the lake The readings of his instruments given at the close of his first letter, though few, are very satisfactory.

The aneroids appear to have rather a large index error, but, as it is not precisely given, they must stand over for the present. The boiling-point observations, by two instruments of different makers, are to be preferred From the fact of Captain Speke and Mr Stanley observing near the same spot and with the same class of instrument, their observations can fairly be compared. The same method and tables have therefore been used for both observers—viz, the Meteorological Tables by A. Guyot—with the following results —

	Feet
Captain Speke on his map gives	3740
Mr. Stanley's observations give	3808
Difference	68

And this difference may be greatly reduced when the Kew verification has been ascertained

2. *Remarks on the Weather, Winds, and Ice in the Arctic Seas during the past Season, as affecting the Prospects of the Arctic Expedition From Observations in Davis Straits and Baffin Bay,* 1875 By Captain ADAMS, Whaling Ship *Arctic*

ON 12th of May, 1875, I was with my ship in the vicinity of Cape Farewell, where I found heavy ice of the usual rugged hummocky character This ice is brought from Spitzbergen by the Polar current by way of the Island of Jan Mayen and south coast of Greenland Sometimes difficulty is found in getting through it, but this year I got through with little or no trouble

I made the south-west pack in the neighbourhood of Resolution Island, which bore from me 120 miles distant to the west The ice here was of a lighter character than usual, owing, no doubt, to the mildness of the past winter No whales were to be seen, the banks being covered with ice far to the eastward I then proceeded north and reached Godhaven, in the Island of Disco, on the 20th of May, where I landed letter-bags for the Danish Government The natives here informed me that the winter had been very mild, with a cold spring following On leaving Disco I found large sheets of open water No heavy barrier of ice at Hare Island, but the frost very intense On the 23rd of May the thermometer stood 4° to 5° below zero, a very unusual circumstance in this quarter at this season of the year The frost being so keen the young ice formed very rapidly, so much so, that my powerful vessel, *The Arctic*, was almost stopped After several days' boring, I reached Upernavik, where my ideas as to the past winter having been exceptionally mild, but followed by a severe spring, were confirmed by Mr Thuckason, the Governor of the settlement, who informed me that at Christmas the natives were pulling about in their kyaks on the water, hunting seals and visiting the neighbouring settlements—feats which have seldom been known before at that time of year

On leaving Upernavik I found some difficulty in getting north towards Melville Bay, but passed through the Bay with little more trouble than in any of the mild seasons which have been experienced during the past few years On arriving at Dalrymple Rock I took on board some natives belonging to the Arctic Highlanders of Ross and Parry These natives were moving north from Cape York and Eider Duck Islands towards Etah, and I told them of the Expedition, asking them to keep a look-out for it On the 5th of June I was glad to reach the North Water, about three miles north of Fitzclarence Rock, and passed close to the southward of Carey

Islands on the same day. Here there was a long rolling swell on the sea, which gave me the impression that there was a large extent of open water to the northward From this date, with scarcely an interval to the end of the voyage, east and north-east winds prevailed After a short stay in Lancaster Sound, I came out and cruised in Baffin Bay during the remainder of the fishing season About the 14th of October, I met a large pack of No 1 ice This ice, owing to the prevalence of north-east winds, could not have come out of Jones or Lancaster Sounds, and as Whale and Murchison Sounds are of limited extent, so much heavy ice could not have come from that quarter, it must therefore have come from Smith Sound This leads me to think that the season has been much more favourable for getting up Smith Sound than for any work towards the west, say by Lancaster Sound Although the spring this year in the Arctic Regions was late and cold, the summer and fall were mild and remarkably clear from fogs, and, in my opinion, very favourable for the ships of the Arctic Expedition attaining a high latitude before being forced to betake themselves to winter quarters Altogether, looking at all the circumstances, such as the mildness of the seasons this and the past few years, the state of the ice, the indications of open water to the north towards Smith Sound, and the long-continued prevalence of easterly winds, which are very favourable for opening a passage on the route taken by the ships, I am quite sanguine as to the success of the Expedition The ships are well suited for the work, and were, from what I hear, in every way thoroughly equipped for the service The known ability and energy of the officers—some of whom I have the pleasure of knowing personally—and the courage and endurance of their crews, are sufficient guarantees that nothing possible to be done will be left undone in order to achieve the object in view, and I therefore anticipate for them a successful return, crowned with hard-won laurels, proving themselves worthy upholders of the long line of hardy British Arctic discoverers who have preceded them, including names such as Franklin, Ross, Parry, and many more, who have shed undying lustre on their country's fame by their deeds of daring in the regions of the far North

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OF

THE ROYAL GEOGRAPHICAL SOCIETY.

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SESSION 1875-6.

Fifth Meeting, 24th January, 1876.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*William Maurice Adams, Esq.*, *Vincent Ambler, Esq.*, M.D., *Capt. S. Anderson*, R.E., *Capt. Charles William Andrew*, *James Bishop, Esq.*, *R. Lowther Bridger, Esq.*, *Samuel Horace Candler, Esq.*, *Thomas Somers Vernon Cocks, Esq.*, *William Hammond Cole, Esq.*, M.A., *Thomas Anthony Denny, Esq.*, *John Forster, Esq.*, *Frederick Morris Fry, Esq.*, *George P. Everett Green, Esq.*, *Walter Henty, Esq.*, *Frederick John Horniman, Esq.*, *Henry Alexander Kettle, Esq.*, *Joseph Samuel Lavies, Esq.*, M.D., *William Lort, Esq.*, *Frederick Cecil Maltby, Esq.*, *Bryce McMurdo-Wright, Esq.*, *Colonel J. C. McNeill*, V.C., C.B., C.M.G. (Equerry to the Queen), *M. J. Nagaoka* (Judge), *Capt. E. C. Royse*, R.N., *David G. Rutherford, Esq.*, *Alexander Stuart, Esq.*, *Colonel S. William Stuart*, *Rev. George Aug. Bright Smith*, *Edward Solbé, Esq.*

DONATIONS TO THE LIBRARY FROM JANUARY 10TH TO JANUARY 24TH, 1876.—Résumé de l'Histoire du Portugal au XIX^{e} Siècle, par le Prince Romuald Giedroyc, Paris, 1875 (*Author*). Excavations at the Kesslerloch, near Thayngen, by Conrad Merk, translated by J. E. Lee, 1876 (*Messrs. Longman*). H.M.S. *Challenger*, Report No. 5, and H.M.S. *Valorous*, Report on N. Atlantic, 1875 (*The Lords Commissioners of the Admiralty*). Memoir of Commodore J. G. Goodenough, by C. R. Markham, 1875 (*Author*). Voyage de Laponie, Vol. 4 of the Œuvres de Regnard, Paris, 1818 (*S. M. Drach, Esq.*). Statistical Register of Victoria for 1874, Parts 6 and 7 (*The Government Statist*). Ueber gewisse betrachtliche Unregelmassigkeiten des Meeres-niveaus, von J. Hann, Wien, 1875 (*Author*) The Yosemite Guide Book, new edition, Contributions to Barometric Hypsometry, and Geographical and Geological Surveys, by J. D Whitney (*The State Geologist, California*) U. S. Geological Survey of the Territories, Miscellaneous Publications, No 5, and Bulletin, No 5, second series (*Dr F V Hayden, State Geologist*), and the current issue of corresponding Societies, &c

DONATIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF JANUARY 10TH, 1876 —Chart of the Suez Canal, compiled from the Admiralty and French Surveys (*G Philip and Son*) Atlases Atlas of the Counties of England, reduced from the Ordnance Survey, by E Weller, Esq, F R G S, Philips' Handy Atlas of the World, by J Bartholomew (*G Philip and Son*). Atlas of the Terrestrial and Celestial Globes, in gore sheets, by Mercator, 1541–51 Facsimile, (*Baron Solvyns, Belgian Minister*)

The PRESIDENT informed the Meeting that, according to the most recent accounts, Lieutenant Cameron was still at Loanda, detained there not only by the state of his health, but also by his desire to find means of sending back, before he left, his native attendants, more than fifty, to Zanzibar Up to the present time he had not been able to carry out his purpose It was not only a part of the original agreement, but it was naturally a duty on the part of Lieutenant Cameron to see that the men were conveyed back to their homes on the East Coast On a former occasion a party of Makololo men, who had been taken to Loanda, attempted to return across the Continent, but never succeeded in reaching their homes, which was a sufficient proof of the danger of the land journey * Lieutenant Cameron had been, and according to the last letters was still, in negotiation with the owners of a small yacht, called the *Busy Bee*, to carry his men to the Cape of Good Hope, but the Council of the Society had that day decided to ask the Admiralty to assist them The Captain of the gunboat *Spiteful*, on the Cape and West African Station, had sent home a general report of Cameron's work through the Commodore, and it was now proposed to ask the Admiralty to instruct that officer to afford such assistance as he might be able to render in order to get the men to the Cape of Good Hope, from whence they could proceed to Zanzibar in the regular mail-steamer As soon as he could dispose of his men, Lieutenant Cameron would, no doubt, come on to Madeira, in order to profit by the climate of that island He was not in a condition to face the English winter at present, but if he remained at Madeira a couple of months he would be able to reach this country about Easter, at a tolerably favourable season Mr Lovett, a well-known yachtsman, and a connection of Lieutenant Cameron's, had liberally offered to place himself and his yacht at the disposal of the Society, for the purpose of bringing the traveller home from Madeira, but it was not yet known whether Lieutenant Cameron would not prefer coming home direct in a steamer

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* It is a mistake to identify this party with Dr Livingstone's own attendants The men belonged in reality to an Arab merchant, Said bin Hubêeb, and the Doctor was in no way responsible for them His own Makololo escort he conducted in person to Quillimane, where they awaited his return from England, and from whence they subsequently accompanied him to Sekeletu's camp at Linyanti

About a month ago, just before authentic intelligence reached England of his arrival on the West Coast, rumours were in circulation, founded on wrong information conveyed by telegram from Egypt, that Lieutenant Cameron was detained in the interior of Africa because he had no pecuniary means of prosecuting his travels When that story reached the ears of the King of the Belgians, he at once wrote to his Minister in this country to say that, if it were true, he was quite ready to take upon himself the personal responsibility of paying the expenses of bringing Lieutenant Cameron back to England However, when the Belgian Minister conveyed to the Society His Majesty's liberal offer, he (the President) was able to explain that the rumour was a false one, that Lieutenant Cameron was in no immediate want of funds, and that he had actually reached the West Coast At the same time he expressed the gratification which it must afford the Society and the public of England to find that His Majesty took such an interest in geographical discovery Of course, under the circumstances, he had not felt at liberty to accept this liberal offer, but he might state that His Majesty talked of placing, if necessary, some 100,000 francs to the credit of Lieutenant Cameron for the expenses of his return journey This was one proof of the great interest excited among the nations of Europe by the journey across Africa Communications had also been received from the Geographical Societies of Belgium, France, Italy, and Germany, congratulating the Royal Geographical Society on Lieutenant Cameron's brilliant achievement, and urgently requesting early transmission of his Report and the map of his route. The Society would endeavour to meet the wishes of these various Societies A map, indeed, of the route was now in the engraver's hands, and would appear in the next number of the 'Proceedings,'* and, as far as possible, immediate publicity would be given to all information arriving from Lieutenant Cameron By the last mail another large sheet of observations had been received, fully carrying out the promise of the earlier register, in fact, there was no exaggeration in saying that the registered observations already sent home were the most complete that had ever been presented to the Geographical Society by an explorer, except in the one single case of Mr. Chandless, the South American traveller

Turning to the subject of the Paper about to be read, the President said that last year considerable interest was excited in England by the Russian movements on the Caspian, and to the east of that sea It so happened that about the same time there was occasion for the presence of a British officer in Persia, to examine into the circumstances of a raid which had taken place on the Afghan frontier near Herat Captain Napier, son of the Commander-in-Chief in India, was sent there for that purpose, and knowing the interest taken in the Turcomans, he returned along the Persian frontier, from the vicinity of Merv to the Caspian, and had sent home a most elaborate report upon that tract of country This was of special interest, not only because the line in question formed the boundary between the newly acquired Russian territory and the kingdom of Persia, but also because it was the only convenient route for the march of troops from the Caspian towards Afghanistan Captain Napier's Report was of such length that it could not be read to the Meeting *in extenso*, but Sir Frederic Goldsmid, who had himself visited the country, would select such portions as he might consider most important Colonel Macgregor, of the Quartermaster-General's Department, who had also very recently arrived in England from the Turcoman frontier, would afterwards furnish some particulars of his journey in those regions.

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* It appeared in Vol. XX, No. II.

The following Paper was then read by Sir F. GOLDSMID —

Captain the Hon. G. Napier's Journey on the Turcoman Frontier of Persia. By SIR FREDERIC GOLDSMID, K.C.S.I.

CAPTAIN NAPIER left Gulhak, the summer retreat of Tehran residents, for Khurasan and the region of the Perso-Turcoman frontier, on the 3rd of July, 1874. He took the Firúzkúh, or the more northern and direct of two roads to Shahrúd, but by diverging towards Astrabád to enter the mountainous tract between that town and Shahrúd, he extended his distance to at least that of the lower, or Semnan road, which may be roughly estimated at 250 miles.

Besides having the advantage of shortness, the road by Firúzkúh is interesting and picturesque compared to that by Semnan (chiefly attractive in its towns, such as Damaghan, or the quaint village of Lashgird). It is more among the mountains and on the higher *plateaux*, and not so monotonous and generally desolate; nor does it at any time touch the skirt of the great salt desert. The soil of one plateau traversed between Tehran and Firúzkuh is described by Captain Napier as "a fine alluvium, with little sand or gravel, and of considerable fertility."

The village of Firúzkúh, a very short half of the way from the capital to Shahrúd, had been partly emptied by the late famine. It is otherwise described as of 500 houses, situated at the south side of a plateau, intersected by a small stream with marshy banks, and, at the point where the waters penetrate, a gorge shut in by limestone cliffs. Above are ruins, supposed to be of a fortress, "built by Alexander the Great." From this place the main road runs in a northerly direction to Sári, the capital of Mazandarán; but Captain Napier pursued an easterly, or, rather, a course E.N.E., through the grazing grounds of Gúrsafid, occupied by the nomads who winter around Semnan, rising to a height of 9400 feet on the Khing plateau, and passing through the valleys of Khing Kharra and Fauládd Muhala to Chashma-i-Ali, or the Fount of Ali. This place, as its name would imply, is held in great regard by Persians, and I have heard, when in the neighbourhood, marvellous accounts of its healing properties and exceptional virtue. The foot-print of Ali, son-in-law to the founder of Muhammadanism, is shown to the many passing travellers and pilgrims, "carved out on a block of stone, and protected by a wooden railing from too close inspection." But such signs are frequent in countries where the Shia'h form of Islam has had a prevailing influence.

From Chashma-i-Ali to Shahrúd, the route chosen was of peculiar interest, for it led through the Tang-i-Shamshirbúr, or "Pass of the Sword-cut," described as "a curious natural passage between two perpendicular strata of limestone, as smooth as a wall, and of 20 to 30 feet in height. The softer strata between and on each side of the limestone have apparently been worn away by the action of weather. The passage is 150 yards long, with an average width of about 18 feet. A little stream and the path find an exit through a natural gap, 14 feet wide, and nearly meeting overhead."

Captain Napier here adds, "there can be little doubt that this is the pass known as the Caspian Gates, or Caspian Straits." The question is an interesting one, but, in now reviving it, we should bear in mind that Morier, *who personally inspected and described this very pass*, does not even hint at such a coincidence. On the other hand, arguing on and rejecting the evidence in favour of other passes near Firuzkúh, he considers the *Sar-i-darah*,* which divides the Khar Plain from the plains above Aiwáni Kaif in the lower country and is a remarkable feature in the landscape, to be the likely site of Alexander's "Pylæ." Ferrier, nearly forty years later, and without allusion to Morier's theory, supports the same view with some ingenuity of detail, and Eastwick agrees with him. Meanwhile, Morier's map of the particular tract we are traversing, though drawn out more than half a century ago, is well worthy of present reference.†

Halting in Sáwar, once a flourishing pastoral district, containing thirty-two, but now only seven villages, and ascending the "Jahán-numá," or "world-displaying" peak, the highest point of the range, save Damávand, Captain Napier, instead of continuing the road to Astrabád, retraced his steps to the southward. He had pitched his camp on the main track leading to Shahrúd at a pasture-ground, with cultivation on the banks of a stream, called Asp-o-Naiza. From this point to Shahrúd, he followed the stream through a narrow defile, called the "Tang-i-ludián," overhung by stupendous walls of limestone-rock. "The strata everywhere violently contorted, and in many parts vertical, have their exposed edges worn into the most fantastic shapes" Coming from the high country down to the Shahrúd-Bostam Plain, the ruined appearance of the watch-towers gave evidence to the traveller that the Turcoman raids were no longer dreaded This peaceful state of things is, unfortunately, local. East of Shahrúd, and possibly near Astiabád, the Turcoman is still active in mischief, and the "Al-amán," or raid,* is in vigorous operation. Whether Russian progress in the regions north of Khurasan will tend to stop the evil remains to be seen Suppression can hardly be looked for except by the use of a strong hand and strong arm *somewhere*

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* Ferrier calls this *Sirdári*. I should have thought him wrong, but that he is followed by Mr. Eastwick. *Sar-i-darah*, or the "head" or "opening to the valley," is, however, the reading I have adopted in accordance with Morier and others. (The real "Caspian Gates," described by the Greek geographers, are probably represented by the *Tang-i-Sulúh*, a defile in the same range and a few miles to the north of the Sar-i-darah, which I examined and surveyed in the year 1837. As the high road does not at present pass through the *Tang-i-Sulúh*, it is very little known, but the physical character of the defile is most remarkable, exactly agreeing with the Greek accounts, and the distance between Aiwan-i-keif and Khár is shorter by this pass than by the Sar-darah.—H. C. R.)

† Burnes considered the "Gudook," or pass between Firzúkúh and the bridge known as the "Púl-i safid," to be identical with the Pylæ Caspiæ.

Captain Napier moved eastward from Shahrud to Mazinán (about 107 miles) by the ordinary and often-described post-road Hence to Nishapur he changed his course, and made a circuit of 166 miles, or about 50 miles in excess of the distance by the main route. This section relates to an interesting tract of country, and the places visited are not all to be found in existing maps. The last march into Nishapur was from Ma'dan Bálá, the "upper mine," the locality of the far-famed turquoises This, we are told, is one of the villages inhabited by the miners As regards the mines, we learn that these, though formerly unique, have now rivals in Turshiz and Yazd, but that, notwithstanding this drawback, the last year's income had increased to 6000 *tumáns* (2400*l*), a larger sum than ever before collected As Mr Eastwick stated, in a work published ten or twelve years ago,† that the Nishapur mines used to be taxed at 1000 *tumáns* a year (400*l*), the figures now recorded show a great increase Whether this circumstance is any proof of material prosperity must be determined by those acquainted with the farming system of Persia

The road from Nishapur to Mash-had, through the mountains,‡ is too well known for present extract It is satisfactory to find that the picturesque village of Dehrúd has in some degree recovered from the painful effects of the late famine, which were apparent to myself on passing through less than four years ago. It was then like the village of the dead—still and desolate

Captain Napier remained at Mash-had from the 10th of August until the 27th of September. On the latter date he left the capital of Khurasan, and visited Kalát-i-Nádari in the vicinity. The distance is reckoned at 74½ miles, and was accomplished in three consecutive days After a week's stay, he returned to Mash-had, ascending the Karadagh Mountain—"the last high peak of the great eastern branch of Alburz"—on his return He writes of it "that the summit of the peak has an elevation of 7870 feet, and commands a fine view of the Plain of Sejind, and of the eastern ramifications of the chain as far nearly as the Herat river on the one hand and of Mash-had on the other The Atak and the desert were spread out like a map, 7000 feet below Each bend of the numerous small streams flowing into the Atak, and the belts of cultivation following their courses for many miles through the sandy plain, were visible, and told a tale of increased security from hostile visitations"

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* "Al-amán" is really the cry for quarter, and is, therefore, it is presumed, made applicable to Turcoman assaults and surprises. It is frequently, however, used by English writers in speaking of Turcomans as individuals or in bodies

† 'Journal of a Diplomate's Three Years' Residence in Persia,' vol ii., p 180

‡ Reckoned at 58 miles I think it must be more, and that the 16 miles to Dehrúd is under-estimated

Another ten days had passed at Mash-had, and Captain Napier started on a new and important, indeed the most important part of his journey. The object was to reach Astrabád, *viá* Tús, Kuchan, Shirwán, Bújnúrd, and Ja-jarm, then by a direct course through Nardin, Naudeh, and Ramáián He accomplished this task in less than six weeks, making a well-judged *détour*, in a northerly direction, from Kuchan to Muhammad Bagh (called in recent maps Muhammadabad), and thence visiting the villages of the Atak and Darah-gaz. Burnes, in undertaking to reach the same point from the same starting place, had less leisure to remark upon the country traversed in detail, and perhaps less means of choosing his several routes or diversions His march to Kuchan (nearly 100 miles) was a matter of three days only, of which no less than 40 miles were got over on the first day Lieutenant Gill's brief but interesting narrative, published in the Geographical Magazine' for October 1874, treats of Kalát-i-Nádiri, the Darah-gaz, Kuchan, Shirwán, Bújnúrd, and Ja-jarm, but the Darah-gaz and neighbouring divisions of the Atak are not described with minuteness of detail, while beyond Kuchan, to quote his own words, he "struck the usual main road between Mash-had and Tehran" So that much supplementary information has been given in the present reports of the highest geographical value, independently of results in a general or political sense.

Between Mash-had and Kuchan the ruins of Tús were visited They are placed at 4 or 4½ miles due north of Kasimabad, a small village 12 miles from Mash-had, which city is left by the "Bálá-khiábán," or "upper avenue" gate, at the north-west. Captain Napier found little of interest in the ruins or traditions of the locality. Nothing presented itself to him indicating an origin prior to Muhammadanism, no coins or relics were to be obtained, and the villagers, questioned on the subject of the tombs of Firdúsi and Harún-ar-Rashid, pointed to a low mound in identification of the first, and had no knowledge whatever of the second. In continuing the route from Tús, the spring called "Chashma Gilás," the villages of Chinaran and Rodkan, and the fort of Amirabad are duly noted, and beyond Rodkan a dry barren tract is crossed between the head springs of the Kashf-rúd, or Mash-had river, flowing to the Hari-rúd and the Kuchan tributary of the Atrak (Attrek). From Ja'far-abád, the last stage before Kuchan, the country is described as sloping gently north and west to the stream which, rising in the mountains north, and flowing through the plains west to Shirwán, passes on by the Garmikhás defile to the region of the Gurgan. This should be no other than the Atrak itself. Kuchan is shown to be half in ruins, owing to a siege under Abbas Mirza and a recent earthquake, and though the recent famine was not experienced there in its extreme severity, the suffering of its inhabitants affords a melancholy retrospect. The population is estimated under 1400.

Leaving Kuchan on the 29th October, Captain Napier moved up towards the source of the aforesaid tributary stream of the Atrak, for 16 miles in a valley, and for 4 miles through a defile, beyond which the stream receives from the east the waters of the "Tavíl," a name applied also to the hamlet of ten houses selected for the day's encampment. He then struck off in a north easterly direction to the main fort and head-quarters of the Khan of the Darahgaz district, which he calls "Muhammad-bágh," and not "Muhammad-abád," as written by Colonel Baker and Lieutenant Gill in common with Vámbéry. It is probable that the natives themselves use both words. "Darahgaz," or, according to some maps, "Deregoz," appears to be rather the designation of a group or groups of villages, forts, and farms, than that of any specific one of these, and in this sense should be inscribed in large letters across the whole central tract of the Atak.* Between Tavil and Chapushlu *in the Darahgaz plain* are two passes, the Maidankhána and the Allahu-akbar, but, notwithstanding the immediate ascent of 900 feet to the first and of 1100 feet to the second, our traveller, at the close of his 21 mile march, found Chapushlu 3600 feet lower than Tavil * A short march further through vineyards, gardens, and cultivations brought him to the residence of the Khan

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* This word is Turkish, and signifies (اتک), the skirt or border, داغ اتکی, the "skirt," or, more truly, the lower slope of the mountain or hill. I am not sure of the meaning of "Darah-gaz." If it were "Darah-gúz," it would imply "choosing the valley," but I think it more probable to be "Darah-giuz," strictly "Darah-giuzí," a Turkish compound, signifying the "eye of the valley." [The *Gaz* is the tamarisk tree, which gives its name to many valleys in Persia.—H. C. R.]

A comparison of the two independent statements of Lieutenant Gill and Captain Napier supplies excellent evidence of the fertility and elements of prosperity which the Darahgaz may fairly claim as its own It would be strange indeed, if immunity from Turcoman inroads could be added to these natural advantages But so enviable a condition can hardly be attained by settlers on the edge of a desert more or less occupied by marauding tribes And when we hear that every field has its tower to give shelter against a sudden attack—that the villagers go to their work with matchlock and sword, starting at sunrise and returning before sunset, and that horsemen equip themselves for fight or flight, as may prove expedient—there is nothing strange in the story It is at least highly satisfactory to learn that hardly any attempt has been made this year to interfere with the harvest work And it should be noticed that on the occasion of Captain Napier's visit, the Khan, or Governor of Darahgaz, whose "wise government" is lauded by Lieutenant Gill, was absent at Mash-had On the sixth day after arrival at Muhammadabad, Captain Napier moved 8 miles north-west to Naukandán, "a large village lying up the course of the Darahgaz stream," and the following day he trebled the distance by pushing on in the same direction to "Duringar," which Lieutenant Gill calls "Darunga," a cluster of four walled and turreted hamlets on the banks of the flowing water Hence he turned towards the Kuchan country, proceeding up the streams for 10 or 15 miles through a defile, and tracing its sources above the large villages of Sherach and Durbadan, eventually reaching Imamgu-ali, a village containing about 100 houses of Zafaránlu Kurds His next march was to Shirwan, a town of 1000 Túrk families, situated at the west end of the plain of Kuchan, and taking its name from a good representation of a tiger on a sheet of bare rock in the vicinity † Of this place the water supply is reported good and ample, and the climate is considered the best in Khurasan, "and therefore in Persia" The Kuchan district is, we are told, "with its two considerable towns,‡

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* In Lieutenant Gill's map it is entered as 2850 feet high, while Muhammadabad is only 1380, so that a gradual descent must be inferred for the 8 miles from Chapushlu to Muhammadabad

† *Shir*, a tiger, and *wan*, an affix, but the whole interpretation is doubtful in this sense.

‡ Kuchan and Shirwán, it is assumed

fertile land, and large and flourishing population, altogether the most important of the border States It is said to have 440 villages, probably an exaggeration Those in the plain may number 80 to 100, and the hill-skirts and mountains may have 50 or 60 more" To estimate the population, we have 40,000 houses and tents, "which, calculating five to a house, would give 200,000, probably not much over the mark, for the towns are populous and many of the villages large They have also not suffered from the famine, the most striking proof of that being a large number of children of all ages In other parts of Khurasan it is rare to see a child of more than two or three years of age"

Bújnúrd was reached in two days from Shirwan, the distance being reckoned at 36 miles The *Kara-lazan** spring, at 2½ miles from the latter place, is alluded to as the supposed source of the Atrak, "the main stream being dry in the summer" From Bújnúrd Captain Napier was disposed to make his way to Astrabád along the banks of the above river, or failing this, to work over the Gurgan, but the authorities would neither encourage nor assist him in carrying out either project, so he passed "between the grand masses of mountain" to Shoughan on the Ja-jarm road, climbing the Aladagh on his right hand, *en passant*, to a height at which the aneroid marked an ascent of 4600 feet Sanghas, the chief of a group of four villages between Shoughan and Ja-jarm, was once a flourishing and populous place, but the number of its houses had decreased of late years from 750 to 200 Captain Napier, referring to the suggestions that Ja-jarm may have been built on the site of the Parthian Hecatompylos, states that there are no visible remains there other than those of a small town of the period of Arab occupation The decrease of population, now estimated at 400 families, when in Nadir Shah's time there were 5000, is attributed to the mischief effected by the Turcomans in destroying the irrigation works and laying waste the country Ja-jarm is a sort of central point for raiders, and the recent immunity enjoyed by the neighbourhood in this respect is accounted for by the force of other attractions presented to the tribes, especially the Yamúts Nardin, the first stage between Ja-jarm and Astrabád, was "reached through barren, waterless valleys," dividing the spurs of the main hill-range from those of the Kuh-i-Bábá, it is the chief village of a *balúk* or district, and its Khan is described as a kind of "warden of the marshes," whose duties are to watch the passes to the west, and repel the marauders, or report their movements, as circumstances enable him to do, with the means at his disposal The second stage to Kanchi, a Túrk village of 150 houses in a glen with a stream, is through the well-cultivated, well-irrigated, and generally well-cared-for valley of Naudeh, which falls rapidly as the traveller proceeds onward, "the mountain slopes on either hand ending abruptly in rugged precipices" From Kanchi a good path winds through the valley to Naudeh, the third stage, "a large village formed of three detached hamlets, in all 200 houses" It is encircled with forest, an effectual barrier against attack from without The houses are built of cane plaited into a timber frame, open in front by day, but closed at night by a curtain of split cane-work, "and the inhabitants are said to be fine active men, well-armed, good foresters, and more than a match on their own ground for any number of Turcomans" The fourth stage, Ramáiyan, is a large village of 400 houses "lying in a glen enclosed by two forest-covered spurs of the *Khush-yalák* * mountains The road lies for "a mile or two through old clearings, overgrown with cane-breaks and dense thickets of bramble matted with wild vine and wild hop," while "beyond and around the clearings is a heavy forest of oak, elm, and beech" This place is apparently in the road travelled by Burnes, when, after clearing the valley of the Gurgan and debouching upon the plain eastward of the Caspian, he observed that the hills on his left rose to a great height, "clad to the summit with forest-trees and foliage "† and hence or from Findarisk, a neighbouring forest-village of Mazandarán, to Astrabád, it is presumed that both travellers pursued much the same road Katul is mentioned as the fifth stage, and it is the last before Astrabad on the road from Ja-jaim followed by Captain Napier The plain here traversed appears to be overrun by the Yamúts, who are practically masters of the country. We are further told that "their nominal allegiance is gained at the cost of the unfortunate peasantry Any attempt to coerce them, if made in sufficient force, would be answered by their retirement beyond the Atrak into Russian territory, a course to which the Persian authorities are very loth to drive them" That protection was especially requisite on this section of the journey may be gathered from the narrator's statement that "a guard of fifty men fairly mounted and armed escorted me to Naudeh, whence a fresh guard took me to Astrabád The road," he adds, "lay for the most part through a magnificent park-like plain extending from the foot of the hills to the Gurgan River, distant 8 to 10 miles."

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* The black caldron.

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* Pleasant summer quarters.

† 'Travels into Bokhára,' &c, vol. iii, second edition Murray, 1835

The return from Astrabád to Tehrán was by the route of Ashraf, Sari, Barfarush,* Amol, and up the valley of the Haráz, and was accomplished in 16 days. The distance is not recorded for each march, but must reach an aggregate in excess of 200 miles. And I believe that the distance traversed in the 24½ weeks taken up by the whole exploration may be roughly estimated at 1400 miles.

Colonel MACGREGOR said, as his maps and journals had not yet reached England, he should be obliged, in what he had to say, to trust entirely to memory. He started from Bushire, with the intention simply to ride through Persia, but on reaching Shiraz the desire of travelling grew upon him and he determined to make for Yezd by a route which, although it had been followed by a French officer in 1810, in the time of General Gardanne's mission, had not, he believed, been traversed by any Englishman. From Yezd he went on to Tubbus, and took the same road as that followed by Captain Christie in 1810. Captain Christie, however, had to pass through in disguise, and therefore was not able to make sufficiently copious notes, so that it was very difficult to follow his route exactly. A little beyond Yezd a portion of the great desert of Kubeer was reached. This runs from Teheran down to the south of Tubbus, where it is connected with another desert—the Dasht-i-Lóot, after which it extends right on through Beloochistan, almost to Sind. In order to get through the portion between Yezd and Tubbus he had to make a march of 70 miles, no water being obtainable for that distance. From Tubbus he went to Toon, and then crossed a range of hills, till he arrived at a place called Kullat, where he struck upon the road followed in 1873 by Sir F. Goldsmid's mission. Thence he went to Birjund, and afterwards pursued the route taken in 1858 by some officers of Khanikof's mission, straight across to Herat. He was, however, stopped when about four miles outside Herat by the Afghans, who would not let him enter the town, and he was obliged to turn down the valley and go off to Meshed (Mash-had). His object in wishing to go to Herat was to see the real importance of the Herat valley, and to inspect the fortifications, and then if possible to go on in the direction of Bamian by the Herat valley route to Kabul, this never having been followed by any European throughout its entire length. At Meshed he made arrangements for going to Merv, but before starting he received an order from the British Government not to go beyond the Persian frontier. From Meshed he went to Sarakhs, and then rode about 15 miles across the desert in the direction of Merv with a party of cavalry, so that although he did not visit Merv, he saw something of the character of the country in that direction. He returned by nearly the same route as that taken by Captain Napier. The Elburz range was continued without a break to the north of the main road from Shahrud to Meshed. Beyond Meshed it was again continued to the south. The watershed between the southern range, and that of the Atak, was almost imperceptible, and, in fact, until the traveller got on it he imagined that it was a plain between the two ranges. The Atak range ran along very nearly parallel with it the whole way from the Tejend river to the Caspian. Between that and the southern range there were two valleys, one draining to the south-east towards Meshed, the other to the west, being the valley of the Attrek. North of the Atak range all the water drained to the strip of country known as the Atak, and beyond that it was lost in the sand, some of it, however, occasionally reaching the Tejend river The Tejend gave a turn off to the north-west, and between it and the last of the water from the Atak range there was a tract of perfectly waste country The road taken by Captain Napier from Nishapur to Meshed, by the village of Debrud, went over the southern range at a comparatively high part, but a little to the south-east of that route there was another road, known as the Sherifabad road, which passed over one of the low depressions so common in all Persian ranges of mountains. From the Sherifabad road the range ran away south, without a break, but it turned off to the north of Birjund, going in the direction of Herat, so that practically the mountain-system of Persia was connected with that of Afghanistan With regard to the Persian frontier, it was not generally known where it ran to the north The Russians had taken possession of the country from Chikishlar to Krasnovodsk, but beyond was a district which, though quite uninhabited, really belonged to Persia But the Persian Government being too weak to take possession of it, it was, therefore, simply a raiding ground for the Turcomans. Until recently the Akhals had been more or less subject to Persia, but their country was now considered to be beyond the Persian frontier, though, if they had the power, they have certainly the right to reclaim it. In the Deregoz Atak, and the Atak of Kelat, however, there were several Persian villages and forts. That part of the country must, therefore, be distinctly considered as belonging to Persia. The question was, how far did this frontier extend to the north? Practically, it extended as far as the water reached, that is, to the outer limit of the cultivable ground to the north of the Atak range, from Deregoz to Sarakhs, which was held by a considerable Persian garrison, the fact thus being that all routes to Merv from the Caspian must pass through Persian territory There were one or two remarks with regard to the Turcomans which he would wish to make before sitting down Firstly, as the Turcomans had in their lands, their manufactures of carpets and clothes, and in their unrivalled breed of horses, ample means of subsistence, and as they were now debarred the slave-markets of Khiva, Bokhara, and Khokand, it seemed evident that their kidnapping propensities would, ere long, die a natural death The second point was of some importance, as relating to the complaints of the Russians against the Merv Tukkehs. Each section of the Turcomans on the north of Persia had its own hunting grounds, the limits of which were perfectly well understood by them Thus, the Yamuts raid the country to their south, going over the range as far as the Tehran and Meshed road, the Akhals took up the hunting to the east, and raided in Bujnurd, Kuchan, Deregoz, and to the south round Jah-jarm, and Jowen, &c , while the Merv Tukkehs confined themselves to the country between Meshed and Herat, going as far south as the Duroh hills in Birjund Thus, in supposing that the Merv Tukkehs were likely, unless provoked, to interfere with their posts, the Russians were evidently mistaken, as this section was no more in the habit of raiding towards the Caspian than the Yamuts were towards Meshed.

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* It is curious to contrast Captain Napier's description of Barfarush, that the streets are "clean and well paved," with that by M. Gmelin a century ago: "Toutes ses rues sans exception ne sont point pavées, et pour peu qu'il y pleuve quelques jours de suite, on a bien de s'y tirer de la boue." And though Captain Napier mentions that a few Russian merchants reside there, we have M. Gmelin's evidence that so far back as his period of writing, of the eight caravansarais in the town, there were no less than four "destinés pour les Russes et les Arméniens."

The PRESIDENT said it was always of interest and importance to have the papers which were read before the meetings verified and illustrated by gentlemen who had recently been in the district described Colonel MacGregor had lately traversed the very country of which Captain Napier had given an account He (the President) had not himself visited that particular region of Persia, his own personal observations having been confined to the lower side of the range from Teheran to Meshed, and to the Caspian provinces generally, but he would say that Captain Napier's report was of great interest, both politically and geographically. It was politically important, because it described the country which was at present in dispute between Persia and Russia, and which afforded the only convenient road for a European army marching from the Caspian towards India That fact alone would make it of great importance Of course he did not mean to suggest that there was any immediate prospect of its being used for such a purpose, but still as the line of least resistance it must always be a tract of country possessing considerable interest for the Government which administered India The chief point at present in dispute between Persia and Russia was their boundary along this line from the Caspian Sea towards Merv The Russians had assumed that the Attrek river was the boundary, but this was a mere assumption All that the Persians had conceded was that that river should be the boundary at its mouth and for a short distance from the Caspian, but beyond, on approaching the hills, they claimed the watershed of the Attrek—all the country that is watered by the streams flowing into the Attrek—while they admitted that the country watered by the streams flowing northward should be excluded from their territory That would probably be the basis of delimitation whenever a Commission was appointed to decide the question, similar to that over which Sir Frederic Goldsmid presided in Seistan With regard to the line of country along the northern hills, the Russians had actually penetrated not only as far as Beurm, about 40 miles to the eastward of Kizil Arvat, but they had sent out their scouts and reconnoitred the whole line, so that on the Russian official maps every village from Kizil Arvat to Merv was laid down with approximate accuracy The Geographical Society, however, did not, as it was well known, discuss political matters, and he would, therefore, only remark that for the last two or three years there had certainly been very much less agitation, and much less indication of restlessness on that frontier than previously All that was positively known at present was that the Russians were occupied in selecting a site for a fort near the position of the old Kari Kileh Captain Napier's report had brought to light several very important matters, relating not only to the present but to the past geography of the country The Russians had lately claimed to have made several very important discoveries, but he could prove that, in reality, such discoveries were due to Englishmen and not to Russians He was by no means jealous of Russian discovery and research—on the contrary, the Society was very much indebted in many cases to Russian exploration, but he felt that when Englishmen had made a discovery, they were entitled to the credit of it This was especially the case in regard to the southern arm of the Oxus It was not pretended that this bed could be traced exactly, but the Russians claimed to have discovered it approximately, and the way in which they announced the discovery was as follows —

"Colonel Stebnitski mentions that a Turcoman, named Atta Murad Khan, bore evidence to the fact of the existence of a dry river channel proceeding from Charjúi, in Bokhara, to the central position of the Uzboi, and the Krasnovodsk detachment, during its unsuccessful march to Khiva, came upon a wide bed, at 5 versts distant from Igdy, which stretched away eastward into the Karakum desert"*

But it so happened that this channel of the southern arm of the Oxus, in which the river ran in the time of Alexander, and until long after the commencement of the Christian era, had been discovered and identified by English travellers forty or fifty years ago The first two travellers he would allude to were Lieutenant Shakespeare, and Mr. Taylor Thomson, the present minister at Teheran, who, when on their respective journeys from Merv to Khiva, in 1840-41, came upon the river-bed at a point named Takht-i-Sulimán, about 50 miles from the present bed of the Oxus Lieutenant Shakespeare's notice of the place was as follows "The River Oxus is said in former years to have flowed near this spot," and here accordingly his party found water in the desert Mr Thomson described the same place, and said

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* St Petersburg Official Paper, December 11th, 1873

"Water is only found on the steppe at the depth of many fathoms beneath the surface, and is both saline and fetid, while here at a high elevation, and by merely scraping the sand for a few feet with the hand, sweet water oozes out and fills the cavity This circumstance is considered by the Uzbegs as a miracle, and is attributed by them to Solomon, the son of David; but the more natural explanation would be, that a considerable fissure from the bed of the Oxus, which comes from a point at a greater elevation, finds its exit here, and in the lapse of ages, having discharged its water impregnated with fine sand, has given rise to the monticule as it now appears, and whose dimensions will probably increase"

That was the first discovery of the upper part of the southern arm of the Oxus, not far from the point of bifurcation Captain Napier, in the present report, stated that—

"From Kahriz there is a route to Khiva, a journey of twelve days for camels, along a line said to be provided with wells at each stage The Tejend stream does not reach so far west as this, but on the third day the 'Oguez,' or old bed of the Oxus, is crossed The Turcoman horsemen reach Khiva in six days"*

Long before this, however—as long ago, indeed, as 1826—Arthur Conolly gave a description of the same line, which he saw on his journey from Astrabad towards Khiva He actually followed the old bed of the Oxus, it would seem, through the continuation of the hills that run from Kizil Arvat to the little Balkán, and it was most singular that the Russians did not appear to have ever heard of his discovery He said —

"We marched N N E for two hours, then coming to the bank of a dry nullah we kept along it till we found a place of descent into the bed This after a while led us into deep ravines, and from them we passed into what appeared to be the deserted bed of a once very large river We journeyed north-east up its centre for two hours, then a little before sunset halted to prepare a meal

"The Syud and I, parting from the centre, walked each to a bank and measured jointly about a thousand paces The soil differed from that above, having gravel and pebbles, and against the right bank (presuming that the river ran to the Caspian), to which I walked, many large stones were collected, and the earth near it was coned up, as if by the strong force of water The banks, which were very high and much worn, would run for some distance at a breadth about equal to that we measured, then they would be broken into a succession of deep parallel ravines, each the size of a nullah

"We wished to believe ourselves in the bed of the Oxus, and indeed we calculated that we had come far enough north to meet with the supposed ancient course of that river, but we feared lest the very wish to decide so interesting and long-controverted a question might influence our opinions That it was the bed of a very large river was apparent (the Toorkmans call the bed *Marsullee*—the meaning of the word I know not), though at what period deserted, and from what cause, there was little to show. Mouravieff speaks of an earthquake which happened 500 years ago, and we are told of a great flood about that time. All agree in saying that at such period the face of the country was materially altered, but the Toorkmans have no books, neither have they very positive notions about time or events" . . .

"My friend the Syud carried his speculations much further, for he not only saw no reason why this great bed, which could be traced so far east, should not be admitted to prove the ancient historian's account of the Oxus, but he was inclined to think that, if the water of one of a river's two arms was turned off (as it is traditionary that one stream of the Jihoon was) by human agency, it might by the same means be conducted back again, so as to afford the Russians water-communication between the Caspian and the capital of Karazm. This would, indeed, be revolutionising Asia.

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* Captain Napier's Report, January, 1875

"The night set in dark and rainy. At eight o'clock we loaded the camels and marched up the bed for an hour and a half, when we got into a narrow path between rocks. Not a star shone out to guide us, and the rain making the path slippery, the camels moved unwillingly on, steadying themselves at every step. We lost our way more than once, but at last our guide found the spot he was in search of, and from two till five o'clock in the morning we halted at a spring of delicious water, rising from a plateau of fine grass. We marched away hence north-east, and getting on the plain again, after an hour, halted near some high tamarisk-bushes, with which we made a fire to dry our clothes and bedding. From this point we viewed the hills which we had left, running in a segment of a circle nearly north-east by south-west, and touching either horizon. They are named Anjeree, and are apparently of volcanic origin, being formed of differently-composed rocky strata, set very irregularly in various coloured earths. On some of the narrow flats between the rocks grew excellent grass, and here and there a small tree."*

As the travels of Arthur Conolly 50 years ago were very little known, and had never received the attention which they deserved, he (the President) was glad of this opportunity of assigning him the credit of having first discovered in modern times the bed of the southern arm of the Oxus.

In order to explain the frequent variations in the course of the Oxus, it was necessary to explain that the country on the left bank of the river sloped away to the west, so that the natural drainage carried the water to the Caspian; while, on the other hand, the operation of Baer's law (as it was usually called), which depended on the rotatory motion of the earth, threw the current against the right bank, and thus carried the stream northward, in the direction of the Aral. In consequence of the action of these opposing forces the river had flowed at various times in three, or, perhaps, four, different channels. The southern course of the Oxus, which had been recently rediscovered, was nothing more nor less than the old Ochus of the Greeks; a comparison of Strabo with the historians of Alexander and the later geographers left no doubt upon that point. There had always been a great confusion in antiquity between the names of the Oxus and the Ochus, but these were simply the Greek forms of the Vakhsh-áb and the Vakh-áb, which were the two upper arms of the Oxus; and as the channels accordingly fluctuated in their lower course, the names were applied sometimes to one, and sometimes to the other. Strabo thus wrote:—

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* Conolly's 'Travels to the North of India,' vol. i. p. 49. It is singular that up to the present time we have no verification of this remarkable notice of the passage of the Southern Oxus through the Anjeree hills, nor, indeed, any mention at all of the lower course of the river between this point and the sea, although the Russian detachments in passing between Krasnovodsk and Kizil Arvat must have crossed the bed both above and below the hills. Napier, indeed, says that there is a continuous ridge of high land from Kizil Arvat to the little Balkan, which would seem to bar the passage of the river in this direction; but, on the other hand, Abulghazi Khan speaks of the southern arm of the river near Dinar, which passed at the foot of the Kurendagh (the range behind Kizil Arvat) (see 'Hist. des Tatars,' pp. 560 and 782), and further, as far as we know of the topography of the country, there is no locality between Kharism and the sea, except the pass in the Anjeree hills described by Conolly, which at all answers to Hamdullah's notice of the defile of Muslim, through which the Southern Oxus found its way before falling into the Caspian with a roaring noise that might be heard at the distance of two or three farsakhs.

"In regard to the Ochus some authors tell us that it traverses, others that it merely bounds Bactria. Again, according to the accounts of some, the Ochus, flowing in a bed more southerly than that of the Oxus, retains a separate course throughout, and the two rivers fall into the Caspian—each in its independent channel and embouchure; whilst, according to different reports, the Ochus is a river which, although it flows at first in a bed independent of that of the Oxus, and is in some places 6 or 7 stadia in width, finishes by joining the Oxus before it reaches the Caspian."*

This passage was further illustrated by the route of Alexander, who, when he marched from Samarkand to Merv, was said by Quintus Curtius to have crossed in succession the Oxus and the Ochus (lib. vii. c. x.), the passage of the first river having taken place probably at Charjúi, and of the second at Takht-i-Suliman.

Another result of this discovery was, that it explained for the first time the question of the origin of the might and power of Parthia. It had hitherto been a mystery to historians how a small district like Parthia Proper, or Parthyene, situated in a desert, could have suddenly developed into a great empire which rivalled Rome; but the fact was, that the region from which the Arsacides sprung was, in the third century before Christ, one of the most fertile and flourishing districts in Asia, watered throughout by branches from the Ochus, or Southern Oxus, on one side, and by the mountain streams on the other. The high road through Asia in antiquity traversed this district north of the mountains from west to east. When Alexander the Great, for instance, pursued his march from Hecatompylus (near Damghán) to the eastward, he did not follow the modern track to the south of the mountains by Mazinán and Sabzewar, which, indeed, was no doubt impassable at that time for want of water, but he struck due north into Hyrcania, at the south-east corner of the Caspian, and thence probably passed through the mountains of the Mardi to the valley of the Oxus. At any rate, in the famous Parthian mansions of Isidore of Charax, where every stage was noted, from the Mediterranean to the Indus, it was quite clear that the route described led northward from Comisene, or Damghán, into Hyrcania, and thence through Astabene (modern Astawá, or Kuchan) to the north of the mountains, following up the valley of the Ochus, or Southern Oxus, by Nissa and Abiverd to Antiochia, or Merv. And this led him also to say a few words on Nissa, the famous Parthian capital, which, being situated on the northern skirts of the range, dominated the Ochus valley. This place could only have obtained the prominence given it in the Vendidád, where it is associated with Merv, Herat, and Balkh, among the primæval capitals of the Arian race, in consequence of the extreme fertility of the Ochus valley. The region, indeed, in question, which, since the river changed its course, had been a howling wilderness, was the original Nisæan Plain, so celebrated among the Greeks for breeding the Nisæan horses, though, no doubt, the name was afterwards applied to other rich pasture lands in Media when the same horses were produced. Nissa, or Nisæa, also, which contained the royal Parthian sepulchres, was given by Isidore the remarkable title of Sauloe, which had hitherto defied explanation; but the President suggested that this merely meant "the royal city," *Sál* being the well-known title of the kings of the Dahæ, a cognate race with the Parthians, who dwelt along the skirts of the hills, and built Dehistán, near the shore of the Caspian. He remarked, indeed, that it was in reference either to Nissa or Dehistán, that the Chinese named the capital of Persia, Souli, or Soulistán. They had sent a mission down the Ochus, or Southern Oxus, to the Caspian in the first century of Christ, when Sauloe, or Nissa, was the real Parthian capital, and the geographical information then obtained remained stereotyped in their annals, notwithstanding later changes The geographical position, indeed, of Souli with the Caspian a short distance to the west, Merv to the south-east, and Urganj (Fo-lin, or Fil) to the north-east, would suit no other locality, and the Tiao-chi and Po-sse, who inhabited the region in question, were simply the Dahæ and Parthians.*

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* Strabo, lib. xi., p. 518.

The President then went on to notice the famous city of Dehistan, now called Meshed-i-Misriyán The Russians, he said, had recently announced their discovery of these ruins, and there was an elaborate description of the site in the last number of Petermann's 'Mittheilungen,' but here again English explorers had preceded the Russians, Arthur Conolly having written the following notice more than fifty years ago —

"Meshed-e-Misreaun was plainly visible about 5 miles to the west, and on Bàbeks rejoining us, after (as he said) a vain search for his oubeh, we marched on and passed close under the south wall of the ruined city It was four-square, each face of somewhat more than three-quarters of a mile I think we counted twenty-five bastions in the south face, they were chiefly of burnt brick, and some were double, like two nuts of one shell Being on a camel, we could see over the broken wall, before which was a nearly filled-up ditch In the centre of the ruined houses were two very high broken minarets, with a stuccoed mosque, in good keeping, and on two sides were remains of high-arched gates, such as now front royal residences in Persia In advance of the south wall was a watch-tower, and fronting the eastern entrance was a large white mosque, in excellent repair Outside the city had evidently been mixed houses and gardens, and at some miles' distance we passed a broken mosque, round which we thought we could distinguish where the beds and walks of a garden had been, from the rain resting in the former

"Of Meshed-e-Misreaun we could obtain no satisfactory accounts From what the Toorkmans said it was evident that they knew nothing about it They do not pretend to know when the city was founded, but they ascribe its ruin to an invasion of Kalmuck Tartars 'Formerly,' said the old Toorkman, who acted as our cicerone, 'the River Attruk flowed past Meshed-a-Misreaun, and the city was defended against the overflow of its waters by a high dam, made of lead When the Kalmucks came, the city held out against them, and seeing that they could not ride up walls, they were for returning to their own place, when a Nero, mounted on a gray lame horse, rode up to the dam and proposed destroying it by fire His advice was attended to, large fires were lighted, and the lead melting, the waters of the Attruk rushed upon the city and levelled the walls'

"Some Astrabaders told us that the name of the city was formerly Meshed-e-Mustaun, so called by reason of the temperament of its inhabitants, who were remarkably *must*, or swaggering fellows Moreover, one of these, seeing that we were keen upon etymology, deduced the word Gôklan from the above-described hero of the gray (Goog), lame (lung) horse. Those who had been within the walls of Meshed-e-Misreaun said that there were many Kúfi inscriptions, and we learn that coins, impressed with the same character, had been found there by Toorkmans, who unfortunately, not being antiquaries, had sold them to Persian money-changers for a trifle under their weight No doubt coins could be procured from the ruins in this desert by means of the Astrabad merchants, who are on terms of intimacy with the Toorkmans I can scarcely believe, from the fresh appearance of many of the buildings about Meshed-e-Misreaun, that so many as 500 years have elapsed since it was deserted "*

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* For Chinese position of Sou-li, see Remusat's 'Nouveaux Mélanges Asiatiques,' tom i p 218 Folin is generally considered to represent the Roman Empire, but in this passage it can only refer to the *Fil* of Kharism. The name of Po-sse was applied indifferently to the Parthians and Persians, and the Dahæ at different periods of history had the double designation of Ta-hya and Tiao-chi The connection of this name with the modern *Tâjik*, as suggested by Khannikof, is very doubtful

The fortunes of this city were perfectly well known to all readers of Oriental history It was the famous capital of Dehistán, having been founded by the Dahæ, who were a tribe of Parthians, described by the Greeks as inhabiting this very country It is quite possible that the river-bed discovered by Conolly may have passed near the ruins, as Vámbery, who also visited the place, was distinctly informed by the Turcomans that it had been formerly watered by the Oxus A well-known Oriental Prince, Abul Ghazi Khan, who wrote a history of the Tartars between 300 and 400 years ago, expressly mentioned that there were two branches of the Oxus running to the Caspian in his day—one the northern arm, now called the Uzboi, and the other the southern arm, which passed along the foot of the Kuren Dagh, and which, turning to the south, probably entered the Caspian by the present channel of the Attrek The name Attrek, he might add, was unknown to the Arab geographers and historians, but the word was probably a corruption of Derbiccæ, a tribe mentioned by the Greeks as inhabiting those hills Kizil Arvat represented the Farawch of the Arabs (compare modern Parao), which was the chief place on the caravan-route from the Gurgan river to Khiva When the Ochus flowed through this region it was a flourishing and well-inhabited country, and if the river should ever be restored to the southern channel the same condition would reappear, while the stream would form a natural and convenient southern boundary of the Russian empire The Russians had, however, never taken any levels along the line in question, and he doubted very much if they would be able to throw the river again into its old southern course He would now make a few general remarks on Captain Napier's paper The Deregoz and Attock (Atak) region could hardly be considered as an unknown country, since, more than forty years ago, Baillie Fraser had visited that part of Khorassan, and had described it in great detail The scene, indeed, of several of his most successful romances was actually laid there, he alluded to 'The Persian Adventurer,' 'The Kizilbash,' 'The Falcon's Nest' A detachment of British non-commissioned officers also served under Colonel Shee with the Persian army in the same region, in 1830–31, and one of the sergeants, Sergeant Hayward, was actually killed in the storming of Sultán Mydan between Kuchán and Meshed Captain Napier had further furnished a special report on the Turcomans, giving the most interesting and important details, and reporting that, now that the slave-markets of Khiva and Bokhârá were shut up, the Turcomans were gradually giving up their marauding habits, and becoming agriculturists. If, indeed, they would only turn their swords into ploughshares, they had a magnificent country at their disposal, watered by the Murghâb and the Tejend, and well-adapted to cultivation, and they might thus become a blessing to Persia instead of a curse.

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* Conolly's 'Travels to the North of India,' vol i p 76 Vambery, in 1863, again visited these ruins, and gives a good description of them in his Travels, p. 100 He places the site nearer to the hills (the Kuren-tagh) than would have been inferred from Conolly's description, and he further observes that an aqueduct carried water to the city from the Persian mountains, 150 miles distant, adding, however, in another place (p 106) that the nomades believed the Oxus to have formerly flowed near the walls, in evident allusion to the river-bed discovered by Conolly, a short distance to the northward Hamdullah, however, says that the city had its own river Dehistan was usually tributary to Jurjan, from which it was distant about 80 miles, but during the first centuries of Islam it was governed by its own Sul or "King" In A H 98 this Sul was besieged by Yezid-ibn-Mohallib, Governor of Khorassán, in an island or peninsula on the coast named Boheireh, 5 farsakhs distant from the city The town, indeed, constantly figures in the accounts of the wars which took place up to the time of the Tartar conquest, between Kharism on the one side, and Khorassan and Mazenderan on the other, and the place was not finally ruined till about A D 1450.

The President then moved the usual vote of thanks to Captain Napier for his valuable paper.

Sixth Meeting, 14th February, 1876.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*F. J. Horniman, Esq.*; *D. G. Rutherford, Esq.*; *Dr. Arthur Leared*; *J. A. Christie, Esq.*; *Philip Rawson, Esq.*

ELECTIONS.—*Commander A. T. Brooke*, R.N.; *Rev. Thomas E. Brown*, M.A.; *Robert Hamilton Few, Esq.*; *Cecil G. S. Foljambe, Esq.*; *Colonel Malcolm Green*, C.B.; *George Grove, Esq.*; *Rev. James Jeakes*; *J. O. Lever, Esq.*; *A. C. Marzetti, Esq.*; *G. G. Newman, Esq.*; *Colonel William Thomas Laird Patterson*; *George Shaw, Esq.*; *Francis Clement Taylor, Esq.*; *James Wainwright, Esq.*; *Henry Woods, Esq.*

DONATIONS TO THE LIBRARY, 24TH JANUARY TO 14TH FEBRUARY, 1876.—Historia geologico-geografica de la Republica Oriental del Uruguay, par C. B. Posada (cuttings from 'La Democracia' newspaper), Montevideo, 1875 (*Author*). The Armed Strength of Italy, translated by Lieutenant W. A. H. Hare, 1875 (*War Office*). First Annual Report of Commissioners of State Parks, and Report on Topographical Survey of the Adirondack Wilderness, New York, 1874 (*Verplanck Colvin*). The position of Turkey in relation to British interests in India, by the Rev. J. Long, 1876 (*Author*). Report on the trade of Kiukiang for 1874, by H. Kopsch (*Author*). South Australia. Report on the Lake Eyre Expedition, 1875 (*H. M. Secretary of State for Colonies*). Radcliffe Observations for 1873 (*The Radcliffe Trustees*). Palestine and Syria, by K. Bædeker, Leipsic, 1876 (*Editor*). Angola and the River Congo, by J. J. Monteiro, 2 vols., 1875 (*Messrs. Macmillan and Co.*). The Threshold of the Unknown Region, by C. R. Markham, 4th edition, 1876 (*Author*). The first 40 years of intercourse between England and Russia, 1553–1593, by G. Tolstoy (in Russian), St. Petersburg, 1875 (*The Hakluyt Society*), and the current issue of publications of corresponding Societies, &c.

DONATIONS TO MAP-ROOM FROM 24TH JANUARY TO 14TH FEBRUARY, 1876.—Twenty-three Sheets of Admiralty Charts (*Hydrographic

Office). Map of Algeria, Dépôt de la Guerre, Paris, 1874; Surveys in Galilee, executed in 1870 by MM. Mieulet et Derrien, Paris, Dépôt de la Guerre (*Société de Géographie de Paris*) The Nile from Ragaf to Makede, Map of the country between Debbé on the Nile, and Obeiyad, Kordofan (*General Stone, Chief of the General Staff, Cairo*) Parts 29 and 30 of Stieler's Atlas of Modern Geography, Part 13 of Spruner's Atlas of Medieval Geography (*Justus Perthes, Esq, Gotha*) Eight Maps from Petermann's 'Geographische Mittheilungen' (*Dr A Petermann*). Relief-Map of Germany (*J. N Fazakerly, Esq*).

The PRESIDENT, in announcing the latest news with regard to Lieutenant Cameron, said that on the application of the Council to the Admiralty for assistance to enable Lieutenant Cameron to send his attendants to the Cape of Good Hope, from whence they might proceed to Zanzibar by the regular mail-steamer, the Lords Commissioners at once agreed to send orders to the senior officer in command on the West Coast of Africa, directing him to detach any ship that might be disposable for the purpose of conveying the men from Loanda to the Cape of Good Hope, thus, in the most liberal and ready manner, acquiescing in the wishes of the Society A few days afterwards, however, further accounts reached England, stating that the Consul at Loanda had decided—in consultation with Lieutenant Cameron—that it would be most economical and expeditious to buy a vessel at Loanda, and send the men round in her to Zanzibar, where, it was hoped, she could be sold without any great loss Accordingly a schooner, which happened to be there, and which was re-named the *Frances Cameron*, was purchased for 1000*l* by the Consul, and was to leave early in January for Zanzibar, with the whole fifty-seven of Lieutenant Cameron's followers on board The command of the vessel was entrusted to a Swede of the name of Alexandersson, who had a very good acquaintance with the African coast, and who had recently forwarded to the Society a large, and apparently accurate, survey-chart of the River Quanza The vessel would probably reach Zanzibar in the course of two months or two months and a-half after leaving Loanda, and would then be sold By the last accounts, Lieutenant Cameron was still at Loanda He had wished to take the vessel round to Zanzibar himself, in order to be sure, as far as he could, of the safe arrival of his men, and also, probably, to avoid exposure to the severe climate of England during the winter months The Consul, however, had thought it of such importance that he should come home immediately, or, at any rate, should place himself within hail of his English friends, that he had persuaded him to go by the next steamer at least as far as Madeira Whether he would remain at that island, or come on to England, would depend upon the state of his health Should he come on direct, he might be expected home in the course of a week or ten days, as he would have left Loanda about the 10th or 12th of January, even if he was detained at Madeira, he would probably be in this country before Easter. His observations were being worked out at Greenwich, so that on his arrival he might have all the materials ready to make such use of as he might find necessary.

While speaking of the West Coast of Africa, he took the opportunity of correcting an error into which he had fallen at the last Meeting, and which, much to his regret, had given pain to the family of Dr Livingstone. In speaking of the dangers incurred by the natives in crossing the continent, he had said that Livingstone's followers, in attempting to return from Loanda, had encountered difficulties, and, in fact, had never reached their homes. He had since found that that remark applied, not to the followers of Livingstone, but to those of an Arab merchant named Said bin Hubêeb. Livingstone returned from Loanda to Quillimane, passing the Makololo chief's camp on the way, his followers remained at Quillimane till he returned from England, when they accompanied him back to their own country, so that Livingstone, as far as was known, was not responsible for the loss of a single African. Still, if he had not been with them in person, they probably would have met with the same dangers and difficulties as the Arab chief's followers, and the arguments which he had used at the last Meeting applied with equal force, showing the extreme danger of crossing the continent, and the consequent necessity of sending back Lieutenant Cameron's followers by sea.

Passing to the immediate business of the evening, the President said the Paper to be read was one which had never been published in England, though it had been printed in China—the Journal of the unfortunate Mr Margary, member of Colonel Browne's Mission, who was murdered last year on the frontier of China and Burmah. Every one felt at the time the utmost commiseration for his fate, and sympathised with his bereaved family. The whole story was a very melancholy one. Mr Margary was a young man of the greatest promise, he was spoken of in the highest terms, not only by his companions, but also by all those superior officers with whom he was brought in contact, and who had the best means of judging of his capacity. He had performed one of the most successful and important journeys that had ever been carried out in Central Asia. He had crossed from the sea-coast of China, through the length and breadth of the land, to the Burmese frontier, and on to Bhamo, which is well within the Burmese territory. It was on his return that he was cut off, and the only fruits of his journey were the Journal which the Secretary was about to read, and the letters which were written subsequently. The Journal was continued only as far as Tali-fu. His proceedings from Tali-fu to Bhamo, and back to Manwyne, were communicated to his family in a series of letters from the Burmese frontier—some during his life, but the greater part after his death. The whole story was a very melancholy one, and still more melancholy from the fact that his father, a very distinguished officer of the Royal Engineers, seemed to have never recovered the blow which he suffered on hearing the news of his son's death. During last year he had three paralytic attacks, from the last of which he never rallied. These circumstances rendered the memorial of Mr Margary's journey which was to be read all the more interesting, and it was fortunate that the Meeting was favoured with the presence of Sir Rutherford Alcock, who had had so much personal experience of China, of Colonel Yule, than whom there could be no higher authority on such matters, and of Dr Anderson, who was with Colonel Browne in the Burmese Mission.

The following was then read:—

Extracts from the Diary of the late Mr MARGARY, *from Hankow to Tali-fu.*

I LEFT Shanghai on the night of Saturday, 22nd August, 1874.

August 28*th*.—Reached Hankow in exceptionally hot weather, and unfortunately in a very bad state of health, which continued for several days, and retarded my final preparations. Mr. Consul Hughes had called upon the Viceroy with the letter from the Tsungli Yamen, and found he had already received despatches from Peking on the subject of my trip. The Viceroy in conversation strongly recommended the Hu-Nan and Kwei-Chou route as that which was usually followed by officials, and was just now selected by the Governor of Yun-Nan, who was on his way thither. Acting on this advice, and, moreover, finding that time and expense were likely to be saved by adopting this road, I decided to do so The Viceroy directed all the officials along the route to aid and protect my progress

My preparations were completed for starting on the 3rd The boat was one of those commonly called a mandarin boat, long and narrow, and divided into five or six compartments, which ran the whole length of the craft, the centre being occupied with a somewhat wider and neater space, fitted with chairs and tables, and suited for the reception of guests Each compartment contained a couple of low berths, one on each side of the passage running down the middle But as a Chinaman's average stature falls far short of an Englishman's proportions, I found it necessary to lengthen the bedside of my compartment by removing the dividing panel A similar precaution had to be taken with regard to the floor, whereof the boards were lowered fully 6 inches, to save my head from the pains and penalties of trying to unroof the not too substantial top. My party consisted of five, comprising a writer, an official messenger, a cook, and my body-servant

September 4th—Left Hankow at 11 A M.

September 6th—Tracked against a south wind all day. Country flat and dry, cultivated with cotton and sesamum Only made 45 li, and anchored at P'ai-chou in company with numbers of river junks Left the boat and walked across a bend to the village of P'ai-chou, which looked exceedingly pretty, embowered in masses of trees On a nearer view the village expanded into a large straggling town, full of well-built substantial houses, which spoke of considerable prosperity My writer and messenger were with me We met with civility at first, and sat down at one house chatting with the host But as we passed the quarter by the junks the wildest excitement broke out A mob collected and followed me for fully half a mile along the bund, until I found my boat. It was not very exhilarating, and I confess I failed to enjoy the fun as much as the rest, for they shouted and screamed with laughter, dancing round me as if they were intensely amused

September 8th—Got over 60 li to Hu-hsin Chou, an island in the big river, separated from the mainland by a narrow channel, which afforded a good anchorage to boats passing up. The district city of Chia-yu Hsien was only removed a few li from this spot.

September 11th.—Reached Hsin T'i, a flourishing place, with a great number of river craft massed in the open unsheltered anchorage which faced the long straight frontage of the town. A *tao-t'ai* was established on the bank of the river, whose sole duty it was to collect the timber dues from the rafts, which float down in large numbers. These rafts present a very curious appearance. Seen from a short distance they look like a floating village with a brisk population, and on a nearer view one cannot help admiring the ingenious construction The larger lengths of timber are closely massed together, forming a compact raft of no mean dimensions down the centre of which are constructed a series of neat huts for the crew to live in The head of the raft is shaped off to somewhat of a sharp prow, and at the stern a gallery runs out, fitted with steering apparatus The fast stream of the Yang-tsze carries them down with sufficient speed, but they are also furnished with enormous sweeps, requiring the strength of ten or twelve men to manipulate The raftsmen appear to possess a magnificent form I have nowhere seen such fine athletic frames in China, and could not help stopping to admire the splendid development of muscle, which was so well displayed as they swayed to and fro with the enormous sweeps It may be worthy of remark that I noticed, first at P'ai-chou, and repeatedly afterwards at other places further up the river, the use of a cart in agriculture. It is not often that one sees a Chinese farmer make use of anything so handy. But in this instance the form of the vehicle was so novel, and so different from that which is sometimes used in the province of Chih-Li, that it deserves to be described The northern carts, like others all the world over, are built with their wheels outside the body of the vehicle, the centre of gravity of which is placed low down These Hu-Pei carts enclose their wheels, and are consequently raised high above them, like a railway carriage. The cart simply amounts to a wide platform poised above two wheels upon the stout axles which protrude. Dragged along by the water buffalo, of all beasts the most ungainly, its appearance is more quaint than elegant.

At Lo-shan I deemed it prudent to call on the local official. Having announced my intention of calling at 4 P M, I waited through a very hot day for the welcome diversion. But I was little prepared for the hubbub my presence was going to create. Lo-shan had never been feasted with even the sight of a foreigner, and their very ignorance of his conformation put a boldness to the curiosity of the mob which surrounded me with shouts and abusive language as I proceeded in a hired chair, the meanest of its kind, to the poor abode of the local official. As is usually the case in

China, the rabble burst into the court-yard of the yamên, and were with difficulty repressed from filling even the audience-room by the whips of the lictors at the door, who plied their arms with a will. An interview is never private in China, any more than correspondence. It is not considered indecorous to take up any written document, whether intended to be confidential or not, and to read it calmly through. I have seen a Mandarin, while making a call on the Consul, step up to the writer's table and, coolly putting on his spectacles, read a letter which had just been prepared for another official on an important subject So, too, every interview I have had the honour to assist at has been swelled by the presence of a number of idle spectators I found the official in question to be a very civil and obliging man, well informed, and well disposed towards foreigners He was reading a book written by a Chinaman of rank, named Pin, who some years ago had been sent to Europe to record his impressions of foreign countries, and subsequently published the volume referred to Calling my attention to the book, he frequently remarked that England must be a fine country On taking leave I complained of the conduct of the people, and the officer immediately ordered a couple of his men to escort me back, but their efforts were barely equal to repressing the excited crowd which followed us to the boat, and stood in a dense mass round my chair The best way of pacifying a Chinese mob is by talking to them, and showing them at once that you are familiar with their language and literature. Accordingly I addressed a few words to my aggressive audience, which had the almost immediate effect of quieting and dispersing it

Lo-shan proved to be an exceedingly pleasant place to stop at. A stretch of downs surrounded the town, and afforded me both exercise and sport. I was able to take many a walk free from intruders, and by permission of the mandarin, I shot over some excellent cover. Immediately behind these downs extended a flat plain, as far as the eye could reach, cultivated with rice and the lotus. This is a great lotus district, and a very curious special industry has grown out of it for the people of Lo-shan. It appears that the art or knack of extracting the kernel of the lotus-nut from its hard shell is only properly understood at this place.

September 20th.—Started at 11 A M with a strong breeze from the north-east, which accelerated our progress, but struck me down with fever. We sailed for the celebrated island of Chun-shan, which lies at the entrance of the Tung-ting Lake, opposite the city of Yao chou, and some 30 li away from the latter. Here we took leave of the muddy Yang-tsze, and entered into cleaner waters of a pale green hue

September 21st—The wind continuing favourable and strong, my boatman took the unusual course of sailing straight across the lake instead of creeping along the shore We actually accomplished 180 li at one stretch, and entered the river at 9 P M The lake is extremely shallow, and seems to be very little used, for I only saw one or two junks during the day We anchored at a place called Nan-chai

September 22nd—Sailed up the Yuan River with a good breeze until we arrived at a considerable town stretching along the face of the river, called Ni Hsin T'ang, 60 li from the mouth After remaining half an hour to procure provisions we proceeded on our way The scenery of the river is exceedingly pretty In lieu of bare towing-paths and muddy deposits, which invariably meet the eye in many parts of China, here I was delighted to find grassy banks covered thickly with willow-trees I landed, and walked as far as my weak state permitted Everywhere the signs of prosperity abounded There was neat and careful cultivation of cotton The homesteads adjoining the little farms were well built and well provided, and men, women, and children seemed to be happy and thriving I met with civility from all Stopped for the night at Yin Ho Hsiang, having run over 100 li from our last halt

September 23rd—Passed Lung-yang Hsien, at a distance, by 11 A.M, and stopped at Liao Ya Tsui, only 70 li in advance

September 24th—We stopped at Shih-ma P'u, 20 li from Ch'ang-tê, only progressed 40 li. About midway we came across a small tributary river, which does not appear in three several maps which I possess I am told, however, by the boatmen, that this river communicates with Sha-shih, on the Yang-tsze, and also with Tseng-shih and Li-chou

September 25th—Reached Ch'ang-tê, and had a fine view of the city as we passed along its face on the opposite side of the river The wall of the city, as I observed after we had crossed over, was built very close to the river side, leaving no room whatever for an open suburb to spring up outside, which was absolutely necessary for the carrying on of trade The difficulty here has been got over by building wooden tenements on long piles, imbedded in the very mud of the sloping bank. The result is an exceedingly odd appearance of houses walking on long crooked legs, and leaning at all angles.

We crossed over to the city, and I sent my card to the Prefect.

I had scarcely dismissed the messenger before a boat come alongside, and a mandarin, wearing a red button, stepped into my boat. Not being prepared to receive him I hastily retired to re-arrange my dress, but my visitor insisted on my making no change, shook hands with me, and said that the Prefect had especially deputed him to attend upon me, and that he should accompany me to the next Prefecture. He stayed upwards of an hour, and talked incessantly. After he left, I was somewhat annoyed by people coming down to stare. In some cases they would step on the side of the boat to look in through the windows. It was the great full-moon holiday, and a number of idle characters were about. No direct rudeness was offered, however, although the crowd showed itself inclined to be "larky."

September 28th.—By 2 o'clock reached T'ao-yuen Hsien, a large and flourishing city. The whole frontage of the town was stored up with earthenware water-jars and glazed flower-pots. The place is a depôt for the pottery trade, and large quantities of the above ware are passed on from T'ao-yuen Hsien to Ch'ên-chou Fu. It is the most lawless, independent district in the whole province. The people, if roused by a sense of injustice or misrule, will not hesitate to carry off their chief magistrate bodily to the governor's capital and demand a change. Since this morning we have been entering mountain scenery of a very beautiful and attractive kind. Everywhere vegetation seemed to spring up in abundance. Pines covered all the hill tops, and several stout trees of the ash kind seemed to exist below. I even came across two palms. Stopped for the night at Shui-ch'i.

Li-pi-shêng, the mandarin who has accompanied me from Ch'ang-tê, I have found an exceedingly agreeable companion. He was one of Li Hung-ch'ang's right-hand men in the wars of the rebellion, had been successively rewarded with a number of lucrative posts by that powerful chief, whose confidence he still boasts of possessing. In 1864 he had an appointment at Shanghai, where he acquired a liking for Europeans, which appears to have remained unimpaired. He trusted very much in my being able to give him a helping hand by reporting his diligent attention and civility to me, in my letter to H.B.M. Minister at Peking. Since this morning we entered upon a complete change of scenery. The river, with its beautifully clear water, was considerably narrowed, and began to wind in and out between fine rocky gorges. The rocks rose perpendicularly in a triangular shape out of the shallow waters at their base, with a grandeur which was most impressive. The whole of Hu-Nan is an exceedingly good field for geological examination.

On arriving at our resting-place for the night, I was very much surprised to see a small boat of the very commonest class come alongside, and a couple of disreputable-looking rascals emerge from it with the card of the T'ao-yuan magistrate in their hands He had sent them to escort and protect!! me as far as the next magisterial city. Nothing is done thoroughly in China, the mandarins look to their tenure of office as the golden opportunity for feathering their nest So our worthy friend carried out his instructions as cheaply and nastily as he was able on this occasion He despatched a couple of dirty scullions, or some other such menials, out of the needy crowd that infests all yamêns, hoping, no doubt, that fine words and the foreigner's ignorance would hide devices.

Li-pi-shêng left me next day, and I was now left for "safe conduct and protection," to the care of the two miserable menials in their ridiculous boat, whose frantic efforts to keep pace with us afforded me much amusement

At about 3 P M we passed through several rapids in succession There was nothing formidable about them Five men tracked along the shore, and the remainder staved the boat off sunken rocks with their bamboo poles The scenery was wildly beautiful, and more compact than that we passed through yesterday, a continuation of perpendicular cliffs now and then lined the river side. A mountain path, which was the highway for foot passengers, passed in some places along the very face of the upright cliff.

October 1st.—We passed through the most dangerous set of rapids on the river They extend over 30 li, and are divided into three portions of 10 li each by the boatmen, who name them the upper, the middle, and the lower In these rapids, solitary rocks and rugged ledges appeared everywhere in such profusion, that it seemed impossible for a boat to be guided through in safety The labour was great, but they accomplished it with much skill and success, until we had reached halfway across the middle set of rapids, when a violent collision with a rock produced a leak which compelled them to pull up at a timber station that happened to be near, and spend half an hour over repairs.

The small village we stopped at to make repairs was a very flourishing timber station. The hills at the back were well covered with fine fir-trees, and a mountain stream flowed down from their inmost recesses, facilitating the transfer of the timber from these backwoods to the main stream.

October 2nd.—This morning I had the misfortune to be completely prostrated with a severe attack of dysentery accompanied by acute pain which lasted for some hours. I was obliged to stop the boat for four or five hours in order to ascertain the course which the malady was likely to take, harassed all the time with the thought of being compelled to relinquish my mission, and return to Hankow crestfallen. However, to my great relief, the disease was quickly and completely driven away by opium and ipecac. pills, the efficacy of which in the early stage of this malady I can thankfully vouch for. Although cured, I was left so utterly weak as to be unable to rise without assistance. On October 3rd reached Ch'ên-chou Fu, and on October 5th passed a dilapidated city, called Lou-ch'i Hsien, arriving at 5 P.M. at Pu-shih, formerly the flourishing centre of the timber trade, but now reduced to insignificance by its treatment under the rebel raid On October 6th reached Chên-ch'i Hsien Just stopped long enough to exchange cards with the mandarin, and buy what provisions were procurable The extreme difficulty of buying food has been a continual trouble to me the whole way. Fowl and duck are the only things to be had, and in many places even these are not to be bought. Any European who attempts this route should provide himself with foreign provisions. At Chên-ch'i Hsien the river takes a most remarkable and provoking bend to the south of over 200 li, and then flows north, until reaching the line of its original course, it bends to the west again This deviation forms a complete sack in appearance on the map, and adds greatly to the tediousness of tracking through innumerable small rapids

October 27th—Reached Ch'ên-yuen Fu at 5 P.M. At the entrance of the city a good bridge of five or six arches, which would not disgrace a railway in England, spans the river. Rocky heights completely surround the town, and lend a grandeur to its position. The gorge of the river for the last mile of our approach was very picturesque On one side the rocks extended with such even regularity that they looked like the ancient walls of some Titan city.

October 28th—Left the boat and commenced the land journey. It rained the whole day, and the high road, which was a narrow ill-paved path, became dangerously slippery

October 29th—Arrived at Shih-ping Hsien, where I went straight to the magistrate's yamên, and was well rewarded for my visit An exceedingly agreeable and gentlemanly man the magistrate proved, and in the course of half an hour we became great friends. He begged me to stay and spend the day with him, but I was obliged to excuse myself on the plea of extreme urgency to continue my journey.

The road was fortunately dry next day. The surefootedness and endurance of the chairbearers, who had frequently to carry my weight up long steep inclines and down precipitous paths, in which the stones were so irregular that I could not have walked down myself with their speed, often fairly astonished me, although I had been frequently carried over far worse places in Formosa in a similar manner Two men bore the front shafts of the sedan, and one alone, with a long leverage of poles, sustained the weight behind. At a distance of 30 li I reached Hsin Chou There being no resting-place ahead which could be reached to-day, I readily accepted the hospitality of a very civil mandarin, with whom I had a most amicable conversation He was a Canton man, and had both seen something of foreigners and travelled by steamers.

October 31*st* —The road passed at a very high level for nearly the whole of to-day's stage The valley below seemed to be sparsely cultivated with rice, and large tracts of land remained in a wild state of nature Slept at a place called Ta-fêng T'ung

Next day reached Ch'ing-p'ing Hsien, and, on leaving the town, I noticed a large heap of good coal exposed for sale, which clearly indicated the existence of mines in the neighbourhood. Every village I passed through showed sad signs of the savage havoc caused by the raid of the Miautze Everywhere extensive remains of good substantial stone houses pointed out the prosperity that must have existed, and in their stead twenty years of peace and quiet had only produced a huddled group of poor straw-thatched huts, inhabited by immigrants from Ssu-Ch'uan and Kiang-Si Curiously enough, there are signs of a sudden impulse of prosperity now taking place, for in every village, town, and city, new houses were either just finished or in course of construction

On November 2nd the road passed through a very fertile and beautiful, but wholly deserted region. Large tracts of good arable land were given up to grass and wild weeds This fact alone speaks very plainly of the wide-spread desolation, when we consider how accustomed the Chinese are to cultivate their very mountains up to almost inaccessible heights, and if the desolation is so great on the main road, what must it be in the less-frequented interior? The Miautze have been taught many severe lessons by the imperial troops since their day of triumph, and, indeed, many of them now live in the cities I have passed through, mixed up with the Chinese population I saw several of their women about the streets A wild, fearless look was in their faces, and withal a very attractive expression—such as I have seen in the countenances of the Pepohwan tribe in north Formosa. But whether thoroughly subdued or not, the settlers in the rising villages have little to fear from their lawless neighbours, for a chain of forts has been erected at distances of 5 li apart, each containing five soldiers, which serve as watch-towers, while the whole route is chock full of soldiery

Just as the cities grow in size and start into more active life, as we approach the capital, so the country becomes less neglected, villages appear in secluded hollows off the main road, and every level plot is cultivated with rice One crop had just been gathered in; and the patient peasant was everywhere engaged in ploughing up, with aid of the lumbering buffalo, the diminutive basins into which their paddy fields are divided, and preparing the ground for a second or third crop I noticed a few men thrashing out the ingathered grain with the very identical old flail which our farmers had to use before machinery drove it out of use The only other object of cultivation which I could see anywhere was the tobacco-plant At the end of 45 li, or say 15 miles, on November 3rd, we reached a city called Kwei-ting Hsien, which was, as usual, somewhat in advance of its neighbour in resuscitation I went straight to the yamên, and was very civilly received by the mandarin, who had been at Shanghai and Tientsin, and could not refrain from praising-up everything that was foreign We were to go on to-day a long stage of 65 li, so, in order to save time, I hurried away, thinking my baggage was well on its way But what was my astonishment, on descending to the main street, to find the whole crowd of bearers in a regular mutiny I had to get out and expostulate with them, surrounded all the time by fifty or sixty of the townspeople, who rather took my part, and were exceedingly civil. I was surprised to find that here, as elsewhere all along the route, the Peking dialect was thoroughly intelligible, and that I could understand the people far better than I did in Hu-Nan. My expostulations resulted in the head-man writing out a guarantee that they should carry me to the capital in exactly the same time, under penalty of a heavy mulct

November 4th —In order to keep their promise, my troublesome carriers would have me rise unusually early, as they intended to "do" 75 li this day—of their accomplishing which I certainly felt very sceptical However, they did complete the long stage by 6 P M, and I soon found myself in the yamên of the magistrate of Lung-li Hsien.

The road, for the greater part of the way to-day, passed through narrow ravines, where the grass-clad hills approached very close, and no room for cultivation intervened. Thick hedgerows lined the highway, composed of what in other countries are forest-trees, but here meanly doing duty as stunted shrubs. There were the oak and the horse-chestnut, of which I could not see even a moderately-grown tree anywhere. Fine young Scotch firs were springing up everywhere, and crowning the hills with a fine deep green. Willows and ashes, sycamores and poplars (not the English kind), filled the lower slopes; and now and then I came across a magnificent Spanish chestnut. But the glory of the plain was the persimmon-tree, all ablaze with the brightest yellow autumn tint Wild flowers abounded everywhere, including the camellia, blue-bells, marguerites, in splendid variety and profusion, and the violet. The whole road was a perfect paradise of ferns, and grasses flourished in marvellous variety

November 5th—To-day we have completed our last stage, and entered the capital of Kwei-Chou (Kwei-Yang) I am delighted with the place. The people are most civil, and not in the slightest degree troublesome The main street, through which I had to pass on my way to the inn where my servant had secured lodgings for me, was exceedingly picturesque, with its sign-boards, dyed cloths exposed for sale, and coloured umbrellas spread out to tempt the rain with glittering red or blue or green The first view of the city from the top of the last pass is very beautiful It rests on an uneven plain well supplied with trees, and completely surrounded by high hills, many of which stand solitary on the plain in remarkable forms There were natural fortresses, faced with smooth black rock at the top, otherwise clothed in rich vegetation, and which had been cleverly seized upon by bonzes to build imposing temples up in the air. The inequalities of the ground raised all the imposing buildings above the veil of the walls, which everywhere in China provokingly hide every vestige of a city from the traveller's approaching view. The last mile of the road was literally overloaded with memorial arches of white marble, or other substitute, in perpetual honour of maidens distinguished for piety, and widows constant to the memory of the deceased Their distant effect certainly added to the liveliness of the scene

I called on the Governor of the Province next day, at noon, by appointment, and was most civilly treated by him. A brisk old man, full of energy and intelligence, entered the reception hall after I had waited about a quarter of an hour for him It was a large room, and two sides of it were panelled with glass windows, through which I should think there were fully fifty faces peering in during my interview with the great man. There were lesser mandarins in full fig, and a crowd of household servants. We sat midway up the hall, on opposite sides, more than twenty feet apart. A visitor of high, or equal rank, he would have conducted to the divan at the other end of the room. My first object was to borrow money, which was readily granted, and the next morning a parcel of silver ingots amounting to Tls. 130, or about 40*l*, duly came to hand On taking my leave, the great man did me the honour of conducting me to my chair. My time was completely occupied all the rest of the day in making arrangements to lighten my baggage and to travel more quickly. Being behind time several days, I was anxious to get on as fast as possible, but I found it quite impossible to cut short my stay at the capital under two days, and I was further interrupted by incessant visitors, whose continual "coming" did not cease till midnight I now determined to have nothing more to do with carriers, but to put everything on horseback, so that no delay might occur from short fatigue stages.

Left the capital on the 8th, and on the 9th travelled 62 li to Ching-ch'i Hsien, called on the magistrate, who proved to be a somewhat jovial old man of sixty-two He had a very pleasant face, a very husky voice, and a chronic laugh tacked on to his words I had the pleasure of receiving him later, after dinner, when he showed a liking for sherry, and tried to smoke a long pipe of tobacco, after trying both cigar and cigarette. The country was rather more colonised and cultivated than on the east side of the capital, but still vast tracts of level arable land, bearing distinct signs of former tillage, were completely deserted, and covered with long grass. The villages on the main road are of a most miserable description, composed of huts built of the thick straw of the sorghum, and plastered with mud, or piled up with the stones and *débris* of former prosperity. I could not find a decent room wherein to breakfast, and sat in the open air under the wondering gaze of the whole population But everywhere the people were amenable and well-behaved. It has been my habit to get out my writing-materials whilst waiting for food, and the process always creates extreme astonishment. About midway on this day's route we crossed a very remarkable avenue of hills, extending in a straight line north and south for several miles, with a perfectly flat and narrow strip of fertile land between. Further on, the general direction of the valleys was east and west. Wild flowers filled the road-sides, and the tea-plant, in full blossom, like a single camellia, grew wild all about the hedgerows, developed, untended, into a strong shrub eight or ten feet high.

November 10th.—The whole route to-day passed through a fertile valley, perfectly level, and some six to eight miles wide. The most remarkable feature of the province is its hills. I have above noticed the singular detached cones and pyramids which dot the plain of Kwei-yang Fu (which, by the way, extends north and south), but on leaving Ching-ch'i Hsien a regular conclave of these huge tumuli meets the view of the traveller. I cannot call them mighty, as the highest does not appear to exceed 300 feet After passing through them we entered the fine valley above mentioned It was bounded in its whole length along the 80 li we travelled to-day by these same detached hills They were not contiguous, nor in any way barred progress in, between, or round them in almost any direction, indeed, long arms of the broad valley were seen to penetrate like estuaries through their midst Far away in the southern boundary of the valley, where the hills seemed to be massed almost into a mountain-range, the eye could still see similar separated peaks, which strengthened the presumption that a very large belt of country was here, both easily penetrable and abounding in a complete network of small arable valleys. We reached the prefectural city of An-hsun by 6 o'clock. The undulating downy ground to the east of the city, *i e*, from the side we approached, was one vast graveyard, extending over two or three thousand acres. Either this must have been a favourite cemetery, or the population of An-hsun Fu must have been enormous

November 11th.—Left An-hsun at about 9 A M, and passed through the same scenery surrounding the rich valley above mentioned. Cultivation increased as we proceeded westward, and large tracts of fine rich soil were turned up to view by the plough One thinks of Kwei-Chou as an impenetrable mass of mountains, but it was most agreeable to find it possessed of many fine plains lying in the right direction.

November 12th.—About 15 li from Chên-ning Chou we came to the end of the fine valley, but entered another smaller one, after crossing an easy pass In 10 li more the valleys came to an end, and the road wound in and out among low grass-covered hills, the rocky mountainous peaks having disappeared for the time being We entered the village of Hwang-kwo-su, once a large town, over an old bridge of several arches, under which flowed a considerable body of water, after dashing down a series of small sloping falls. On leaving the place a grand sight met my view There was the river, a couple of hundred yards below the bridge, leaping down a precipice of 140 feet in one of the prettiest falls I ever saw The brown, muddy look of the rock, over which the river flowed, added to the striking effect of the whole

November 13th—The damp white mist, which has surrounded us for a day and a-half, was to-day condensed into the still more uncomfortable form of fine rain, and the thick vapour floated low above the ground. It made travelling both difficult and dangerous, for the stone-paved, or rather stone-strewn, track was provokingly rough in itself; but to-day, for fully 10 miles, we passed a mountainous barrier, over which the road ascended and descended somewhat steep inclines. But even in the midst of this mountain-mass, where the rocky cones were tossed and tumbled like a stormy sea, there was a succession of quiet valleys down below, lying flat at the base of these abrupt boundaries To this region there succeeded a milder track of undulating grass-covered wastes, enclosed by moderate hills fit for pasture, which led down into another broad valley, through which we travelled on level ground for 30 li, to the city of Lang-tai

November 14*th* —We left Lang-tai this morning A fresh escort of two soldiers came in exchange for those from the last stage; I was thus forwarded on from place to place, but in every case I had to deliver the last passport and to make a request for the men. Everywhere, however, I have met with the greatest civility, deference, and even something approaching to obsequiousness Lang-tai was full of houses, and struggling hard to recover from its long depression At this place I first began to discover that there was a Kwei-Chou dialect, which sufficiently diverged from the Peking tongue to puzzle both me and those I addressed, to entirely understand each other. Although our stage was short, it proved to be doubly tedious, as we entered a really mountainous region at last, and the road was full of steep inclines After crossing a low ridge we skirted a fine valley for about two miles, at a great height above it, looking over a rich scene of cultivation and agricultural revival After this we suddenly got locked in among the hills, and rose higher and higher, until we stopped to breathe at the very summit of a short rocky range, running N W. and S.E, which fairly barred the way. My aneroid marked 3400 feet above sea, or rather Shanghai (which is much the same thing), but I cannot trust its accuracy A glorious sight was seen on the other side. We were on a level with the majority of peaks massed together right and left, and far below lay a small plain, to which we had to descend by a very steep path Masses of white mist floated below, and for a time obscured the fine panorama. But we were up in clearer air, and it no longer rained. The descent was difficult and slow. At the halfway-down house, where the steepest parts came to an end, I again looked at my barometer and found we were 1400 feet below the splendid point of view we had just left, which seemed incredible While scanning the mountains from above, I estimated that the average height of the highest ranges was about 4000 feet

November 15*th* —Mê-k'ou, our resting-place last night, was only a village, and to-day's stage of 35 li has brought us to another village, named H'ua-king

As I anticipated, our road was full of rises to-day, and the aneroid marks 3250 feet Two high ranges, running east and west, bounded our horizon, while the intermediate space was valley to the south, and a grass-covered uneven plateau to the north—fit for pasturage Cattle are scarce, but carefully bred There were trees over the hills Deep-red, yellow, and orange tints of autumn showed up with beautiful effect amid the mass of green. The sun had appeared at last and dispelled the mists So that altogether the scene was very refreshing, and the journey far less tedious

November 16*th* —The road to-day passed over a long stretch of wearisome hills covered with tall grass, without trees, without valleys, with only their endless rise and fall always hiding a view of the bold majestic peaks beyond The river at Mê-k'ou, I should have stated, is the boundary of the wild-tribe settlements By inquiries made through my writer, who required some work, I learned something of these Miao-tzŭ, and other wild tribes in the hills, together with the causes of their insurrection. There are two sets of social outcasts—the Miao-tzŭ, and the Chung-chia. The former, although they assimilate both in dress and general features to the Chinese — just as the Shans beyond Yun-Nan, described by Dr. Anderson—never belonged to the Celestial race They were the aborigines of this region at the time when the Han dynasty (B C. 202 to A D. 200) extended the empire westward, and colonised this province from Hu-Nan. The Chung-Chia are the descendants of those colonists. Both "nations" have several subdivisions, distinguished by little peculiarities of dress, and are mostly called by names describing the same. I saw representatives of three or four sects, and could easily see the difference. For instance, there are the White Miao, the embroidered Red Miao, the Black Miao (who, by the way, wear earrings as well as black clothes—the men but one, the women both), the Light-Blue Miao; the Flowered Miao (who wear sleeves only of coloured stuffs, like chintzes or brocades); and, oddest of all, the Duck's-beak Miao (who wear a thing like a duck's beak on the back). The women are the badge bearers, the men doing as they like in the matter. But the latter mostly dress like Chinamen, in the universal blue. The Chung-Chia have three classes The Pu-la-tzŭ, among whom the women wear pig-tails as well as the men, the Pu-i-tzŭ, whose women wear silver plates on the head for caps—*absit omen*—I hope the thirst for novelty elsewhere may not adopt the hint, and the Pu-lung-tzŭ, distinguished by the coiffure resembling a raven. They all wear the Chinese garments, but add a border of some other colour These people exist in great numbers between An-hsun Fu and Mô-k'ou, along the route we have followed The Miao-tzŭ inhabit more generally the region between Chên-yuan Fu and the capital. Judging by the state of the cities, and the universal ruin on that side and on this, I should say that the aborigines excelled the colonists in the fierceness of their onslaught It was a combined movement, and the opportunity arose when the Mahomedans held Yun-Nan, and the T'ai-p'ing rebellion overflowed Kiang-Si and Hu-Nan The reason of this rising was not an idle one The Chinese had oppressed both classes—socially as well as officially—and while the one said, "We are Chinese as well as you, and yet all honours, riches, and advantages are debarred us," the poor, wretched Miao-tzu had to complain of scorn, contempt, and legal robbery in rents and taxes

The further we go west the more we find of cultivation and population. The villages increase on the road, and there is more small traffic, oranges from Yun-Nan, and straw shoes, come along, while drovers are met with flocks of sheep—flying eastward, some say, from the cold weather in Yun-Nan, others, to feed their flocks on the grassy hills of which I have spoken, pasture being scarce in Yun-Nan Kwei-Chou must have a temperate climate, for the houses are not built to guard against cold, and, among other signs, I notice that the horse-chestnut has not yet dropped its faded blossoms. So far, the average temperature we have experienced has been about 55° The droves of sheep have been recently shorn, and numbers of young lambs accompany the flock.

November 18*th*—The road to-day passed through a number of valleys full of rice, and watered by small streams running in a north-easterly direction The distance to the *Chou* city of Pu-an was only 40 li, which had to be accomplished in one stretch.

Next day, about a mile from Pu-an, we began to ascend the last great barrier on our road It was called the Yun-Nan Pass, and exceeded all the others in length But the incline was easy, and the summit moderately high (3300 feet) There was no steep descent on the other side, the road passing over a high plateau of very poor land. Before reaching the crest of the pass I looked back on a lovely scene The fine valley was decked out with autumn tints and harvest gold. The high hills all round were strewn with large patches of red soil in among the trees, and the city with its crowded roofs and triumphal arches lay in a cradle below The last half of the stage was barren ground, rocky rough low hills on both sides, and coarse grass growing among boulders in the middle. Towards the end, however, we came across a beautiful valley, in which all the harvest operations were over, and instead of yellow the sombre colour of rich earth relieved the eye The stage had been a long one, and the bearers, thoroughly tired out, dropped the chair with a well-feigned slip, and so compelled me to walk a long way in the closing darkness over an atrocious path

November 20th—We were now 15 li from the boundary line of Yun-Nan and Kwei-Chou The excitement of crossing the border and entering the famous province, which filled us at starting, was rather damped by the morning rain, but by noon the sun shone out almost uncomfortably and dispelled the mists The road sloped down easily over a red sand waste towards the frontier town, which was distinguished by an arch at each end of its single street The view towards Yun-Nan was disappointing There did not seem to be any termination of the undulating rock-covered hills, which extended as far as the eye could see A short stage brought us to the first city of Yun-Nan lying in our way, the magisterial city of P'ing-i Hsien, where I was received with marked incivility by the mandarin (a Kiang-Su man named Hsia) It was a kind of rudeness which a Chinaman can so easily show without going far out of the way, and consisting in using expressions applicable to an inferior, and omitting forms of etiquette which are held indispensable. He seemed to be suspicious of the local passport, and examined the seal critically. I was able to cut all this short by reference to the Tsung-li Yamên despatches, and the letter of the Kwei yang Fu-t'ai, which he owned to having received. He carried out his instructions, however, and sent two men as escort.

Our road on the 21st was beautifully level over the broad battened red sand, and on the next day for half the stage over another plateau of waste uncultivable land, on which there was little grass, even, but a great quantity of rocks and stones On nearing the end of our journey, the plateau suddenly came to an end, and a very fine plain burst on our view. It stretched away to the south, and widened as it went. The city of Chan-i Chou lay opposite us on the other side of the valley, about two miles off The bearers, with the goal in view, redoubled their speed and almost ran me into the city. I sent my card to the mandarin, but here again the same sort of incivility was offered. No card was returned, and no answer could be obtained to a civil request that the escort might be sent early, since we had to start at daylight. As the mandarin probably knew little or nothing about all this, I sent my writer with the Treaty to enlighten this all-powerful janitor and factotum on my position. The result was that the magistrate's card arrived by-and-by with an answer to my request.

Next day, after waiting in vain for an escort, I started without it. At length a stupid old man turned up, who proved very useless. Instead of sending two or more men, as all previous officials had readily done, they had taken the liberty at the yamên to change the number stated in the warrant, and so reduced me to the certainty of having only one man sent for the rest of the route, for they copy one another faithfully But we are near the capital, the road is good, and the people are civil, so I do not pay much attention to this want of courtesy On starting from Chan-i, we at first followed its splendid valley due south for a mile or two, and then abruptly broke out of it at right angles to ascend a series of small, but uncomfortable passes which led up to another dreary plateau, like those we have already passed The valley was well cultivated with rice, and the harvest being over, the numerous flooded fields gave the appearance of a vast lake to the plain as seen from above. We reached the city of Ma-lung Chou in good time, and found a very fair lodging at the kung-kuan

November 24th—Left Ma-lung Chou before sunrise in order to complete 80 li in good time. The country improved in appearance by the addition of trees, which, though stunted, grew abundantly on the hills and plain, relieving the desert-like monotony of the red soil which still continued.

We slept at night at the town of I-lung Ssŭ, and having another long stage of 75 li before us, left at daylight next day Our road, always wide and level, passed through many lanes and hedge-rows. The wind, as usual every day, blew uncomfortably from the south-west, parching the skin of our faces, and producing disorders of the throat I noticed that it sprang up about 9 A.M, the earlier hours being still and undisturbed Houses everywhere wore a neat and comfortable look They were detached and roomy, built of sun-dried mud-bricks and well tiled But we no longer saw the open exposure to the air which distinguished those of Kwei-Chou Wind and cold were carefully shut out On nearing *Yang-lin*, which was a town now, but must have been a city once, the road skirted a large lake covered in many parts by tall reeds It was an immense expanse of water, and is said to afford quantities of fish. Soon after this a magnificent plain burst on our view, well studded with new villages, but swarming with ruins of old ones.

On leaving Yang-lin the ruins caused by the war were sadly prominent The area covered by houses was evidently very large, and from its splendid site, and quick revival, I should think this must have been an important city. The distance to the capital was 105 li, on a very level road Along the whole route I have had to struggle against wrong information. Distances and routes vary, apparently according to the ideas of different persons, and the result is that I have been misled to the extent of losing 10 days. Instead of 25 days being sufficient to accomplish the journey from Ch'ên-yuan Fu to Yun-nan Fu, I have only managed to reach the threshold of the latter city in 30 days. and this after every effort to hurry my conductors.

November 27th —Reached the city of Yun-Nan before noon My servant met me at the gates, and conducted me to a very good official inn. The road was crowded with people passing to and fro. Carts conveying firewood, mingled with ponies carrying charcoal, jostled coolies coming out with loads of salt slung at the ends of their useful bamboo The short suburb was full of saddlery shops, and the stalls displayed nicknacks, opium-lamps, and ornaments One solitary clock was the only representative of foreign ware which met my gaze The people were not curious or troublesome, and I entered the city unescorted, without the slightest difficulty There was nothing showy in the approach. Ruins surrounded the walls and dotted the magnificent plain stretching far away The city is on level ground, and therefore not picturesque A few very neat and original examples of roofing near the gates showed the best points of Chinese architecture

Next day a splendid double repast of choicest Chinese dishes was also sent down by the magistrate, for me and my servants Eight large wooden trays, containing fifty-six bowls of different dishes and sweetmeats, all ready for the cook's hands, met my view on entering the room, and four cooks from the yamên were ready to operate. I never enjoyed a better dinner After this I proceeded in my chair to call on the magistrate, who received me very well, and pleased me so thoroughly in his appearance, bearing, and straightforward manner, that I no longer cared to see the Governor, and entrusted all I wanted to him. My first object was to communicate with Colonel Browne in case his party should arrive first, and to request the Acting Viceroy to send instructions post haste to the Yung-ch'ang Fu officials to give him every assistance. And secondly, I asked for an escort for myself, and a letter to all the mandarins *en route* explaining my position and object. The magistrate, whose name is Pien, readily promised to convey my requests to the Viceroy, and so, with warm thanks for his civility, I concluded a very agreeable visit

The magistrate returned my call next morning, and said that the Governor was extremely busy just now, but would be ready to see me when I came back from Yung-ch'ang Fu He had deputed a couple of mandarins to escort me the whole way, and was about to send a flying despatch to Yung-ch'ang Fu, which would arrive in four days at that city, and my letter to Colonel Browne would be forwarded by the same opportunity In the course of the afternoon I received a message from the Governor, requesting me to wait another day to allow time for the escort to get ready I was obliged to acquiesce, although time was very precious.

I felt well satisfied with both my conductors They are named Chou and Yang, respectively Both of them, civilian and soldier, were engaged in the campaigns against the Mahomedans and Ta-li Fu, and they described the rebels as fighting with great ferocity

Did not leave till December 2nd The road passed across the valley towards the hills Peasants were hard at work irrigating the fields with water-troughs and paddles worked by the hands Several strings of animals came along the road, loaded with salt for the capital, and irritated the chairbearers greatly by their erratic motion, which continually threatened a collision with the chair. Mules, donkeys, and ponies were mixed up together in each gang, and a couple of mules invariably led the way, decorated in the most fantastic manner about the head with red rosettes and tassels surmounted with a bunch of long feathers like a Red Indian chief. We came to a full stop comparatively early in the afternoon at the top of a small pass between 30 and 40 li from the capital, called Pi-chi K'ou

There was only one decent inn to be found, which consisted of a single large chamber, a small corner of which was boxed off with clean woodwork for superior guests Two gaunt buffaloes were stabled in close proximity on a floor of slush, the kitchen filled a third corner, and Messrs Chou, Yang, and three or four of our servants, found their roosts along the other sides. Chou filled up the time by smoking opium There is something attractive in the process of taking opium, which must compensate a Chinaman for a great deal of discomfort His bedding, which merely consists of a couple of quilts, is neatly arranged by his servant, part as couch and part as pillow, and he throws himself down to play with his pipe and trayful of inviting nicknacks (treasures in themselves), careless of surrounding circumstances. And each whiff costs him some pleasant exertion, for fully ten minutes elapses before the pinch of opium is reduced to the proper consistency by being twisted and twirled about at the end of a short spit in the opium-lamp I had a long conversation at night with the two officers on the subject of railways and modern inventions They praised up the English with a flattery that I was obliged to rebuke. But their appreciation of our moderation in war was genuine, and the name of Queen Victoria was mentioned in terms of respect and admiration They knew the history of Her Majesty's accession and reign, and the exalted character of our Sovereign reflected most favourably on the estimation in which they held the nation, and its representatives in China.

Arrived next day at An-ning Chou, where I was paid extraordinary honours by the local authorities, and on the 4th, having a long stage before us, we started early. The thermometer marked 46°, and a thick white mist filled the air, until the sun rose high enough to dispel it, and the rest of the day was almost uncomfortably hot. The road was rough, and deeply indented by mule-tracks. Hundreds of animals met us employed in carrying salt The greater part of the way was waste, uncultivable land, covered with hardy shrubs and stunted trees But now and then a valley appeared which was partially retilled, and one or two villages, re-established among ruins, stood prettily embowered among trees The semi-civilised border tribes seem to trade occasionally in the province. They wore coloured embroidered garments, and presented other peculiarities which I had not time to notice in passing

The road on the 5th has outdone everything hitherto encountered in utter badness. In addition to its natural imperfections, I believe the retreating Mahomedans purposely destroyed the pavement in order to throw difficulties in the way of the Imperial troops There is scarcely any level ground in the whole length of this tedious stage of 75 li to Lu-fêng Hsien. It is full of steep passes, the chief of which rises to 3500 feet (by my aneroid), and the track by which it is surmounted is simply a chaos of deep ruts and broken stones, offering the acme of dangerous footing to animals as well as carriers On arriving at Lu-fêng Hsien, I was greeted outside the city by the magistrate's card-bearer, who knelt, according to custom, holding up his master's card, and politely informed me that the official travelling quarters were ready for my reception.

On the 6th we started at an early hour, the thermometer at 46°. The stage was the longest we have yet accomplished, being 90 li, and much of it over steep passes. The mountains were thickly covered with pine. All the villages were in ruins, and the valleys, of which we crossed three or four, are sparsely inhabited. One very heavy pass, involving several li of a severe incline, intervenes in the long march, and by a steep descent leads to the town of Shê-tzu

The temperature was 42° at starting next morning, but before very long the sun shone out strong, and by sunset the thermometer had risen 20 degrees. The road was still full of difficult passes and deserted villages. If only an easy road lay ready between Yun-nan Fu and Bhamo a perfect flood of British goods would be swallowed up at once for the Kwei-Chou and Ssŭ-Ch'uan markets. The merchants of the latter province would naturally prefer to buy at Yun-Nan, and float their goods down the Yang-tsze, to the risk and expense of the difficult ascent from Hankow up the I-ch'ang gorge Native cloth is so dear in Kwei-Chou and Yun-Nan that the people cannot afford to buy it, and their ragged appearance is due not so much to poverty as to the price of cloth being beyond their means. There would be an immense sale if only Manchester goods could be cheaply conveyed. Watches are wanted badly by the rich classes, and there is a great eagerness to know the price of most of my foreign productions. Cutlery and ordinary crockery excite admiration, and almost anything foreign would speedily entice buyers, if I may judge by the high appreciation and unfeigned coveting displayed by the few who examined my possessions. Kuang-t'ung Hsien, our destination, lay in a fine valley, which sadly wanted inhabitants to recultivate its broad acres I was well received by the magistrate, who was a young Kwei-Chou man, and before leaving we became great friends

December 8th.—Left Kuang-t'ung The road was far better today and only two insignificant passes had to be crossed I lunched at a town called Yao-chan, which lies in a fine valley watered by a good-sized stream, and contains some inns. The road followed the banks of this river for the latter half of the stage almost up to the prefectural city of Ch'u-hsiung, where we stopped.

December 9th.—We started early this morning in order to accomplish a very long stage to reach the city of Chên-nan Chou. The road was good, and the bearers were able to keep up a fast pace throughout.

Next day we reached the town of Sha-ch'iao, and on December 11th had to rise early in the morning, as 95 li lay between us and the next resting-place, a town called Pû-p'êng by the natives, but which is entered in the Chinese map as Lien-p'êng.

The first 30 li of the way skirted the well-cultivated valley of Sha-ch'iao, then followed 20 li of steep climbing up a narrow ravine, which was full of trees and shrubs, and contained a brook of clear mountain water tumbling down at a great velocity It was a beautiful piece of natural scenery, but the dangers of the rough and tortuous track by which we had to thread our way marred the pleasure which it excited It was disturbing to be hung over a precipice at an angle of about 30°, while the bearers were turning a sharp corner, and to feel the slips which they could scarcely avoid on the loose red sand which thinly covered the rock underfoot. It was one long ascent every inch of the way, until we reached a village at the summit, which was the halfway rest The remainder of the road was tolerably good It first descended a ravine slightly, and then followed a high level, overhanging a deep precipice well veiled with trees This debouched at length on to an arid, uncultivable plateau of red sandstone, undulating, and sparsely covered with shrubs and a few stunted trees. Along this desert we were on a level with the tops of a mass of hills stretching away before us as far as the eye could see. A little cultivation was carried on in terraces, but otherwise it seemed to be a red sand waste far and wide I was surprised to see quite a large town in the midst of this wild plateau, and still more to find that it contained a yamên, in which we were soon very comfortably settled and fed by the hospitality of the Prefect of Yao-chou, in whose jurisdiction the town lay, and who had actually sent down his servants a distance of 180 li, or two days' journey, from the city to provide for us. Such incomparable civility proves how thoroughly the Viceroy is to be relied on His career has been marked by "thoroughness." I listen daily to stories of his remarkable campaigns against the Miau-tzŭ in Kwei-Chou, and the Mahomedans in Yun-Nan, which the old soldier Yang loves to dilate upon after dinner. But as his accent is provokingly provincial, I unfortunately cannot keep pace with his rapid utterance, but I hope to know all about this hero before returning to Yun-nan Fu, where I have been promised the honour of an interview. The Ta-li Fu people are troublesome and dangerous. I was told so by the Chên-nan magistrate, and it was for this reason that the Viceroy sent two mandarins with me We are four stages from that city, and I am to remain a whole day at the previous stage, while Chou and Yang go ahead to ensure arrangements for my comfort and safety.

SIR RUTHERFORD ALCOCK said the Journal, from which extracts had been read, was one of the greatest interest, not, perhaps, geographically—although it did not lack interest even in that sense—but as throwing light upon the relations existing between the Central Government in China and the provinces, a subject on which there had been very various opinions Mr Margary, who was a student when he (Sir Rutherford) was in China, reflected the greatest credit upon the Service to which he belonged, and upon his country generally, for he had passed from the sea-coast to the Irawaddy, right through the centre and south-west of China, into Burmah, a feat which, as Colonel Yule had truly observed, had baffled so many gallant spirits When it was remembered that he was stricken down with fever and dysentery almost at the beginning of his journey, that he persevered, through summer heat and winter cold, for upwards of four months, that he never blenched, was never discouraged, or failed in his duty, but went on with a buoyant spirit through the whole, too much honour could not be done him, or too much regret expressed at the loss of so promising an officer He was a young man of singular powers of observation, and he had used them well in the Journal The Geographical features of the country that he was travelling through, the products that were cultivated, the character of the people, the conduct of the officers—everything passed under his observation, and everything found its note in the Diary There was one unfortunate gap of twenty days, which, probably, was owing to his extreme prostration and sickness, and there was also a large gap between the time when he reached Tali-fu and his arrival at Bhamo Dr Anderson, however, met him at Bhamo, and, from his letters and conversation, would be able to supply some interesting particulars of that part of the journey about which the Journal was silent, more especially concerning the disposition of the Burmese towards the Expedition In the course of his life, he (Sir Rutherford) had had, on more than one occasion, to say some very hard things of the Chinese Government, but he could not read that Journal without feeling that, so far as the Government was concerned, their intention had been to give Mr Margary a *bonâ fide* safe-conduct, so that he might pass through the country in security He drew this inference from some very striking facts. The second day after leaving Hankow, Mr Margary met with great rudeness and jostling from a crowd of junk-men—the most turbulent class of people in China, after the soldiers—and on the fourth day he encountered a good deal of mob-violence, and was in some danger At Chĕn-yuen-fu, which he reached about the twenty-third day, he was treated disgracefully, both by the people and by the officials, and when he forced his way into the presence of the magistrate, that functionary met his representations with a horse-laugh Yet when Mr Margary produced his passport and special authorisation from Pekin, he lowered his tone, and afforded him, however grudgingly, a certain amount of attention It was to be hoped that this Hsien would not escape the attention of Sir Thomas Wade, but would meet with his reward. After that, Mr Margary met with nothing but the greatest possible civility and courtesy, with one or two slight exceptions, and this treatment was more marked, the higher the rank of the official with whom he had to deal, until the Prefect of Kwei Chow not only sent him all kinds of courteous messages, but directed his servants to go two days' journey to meet him, and provided for him with the same care that would have been bestowed upon the most honoured guest. The conclusion to be drawn from all this was, I think, that the higher authorities, who knew best the secret wishes and instructions of the Government, if there had been any, were ready to protect him and show him kindness It was only when he came in contact with subordinate officers that he met with rudeness and violence, and he considered that the Chinese Government was entitled to the benefit of the inference. Again, so long as Mr. Margary was in Burmese territory he was perfectly safe, and when rumours of danger arrived, the Burmese authorities resolutely refused to allow the Expedition to go on until they could satisfy themselves that their doing so would be safe It was bad enough to have English officers murdered, by the disgraceful turpitude of the provincial officials, and in consequence of the bad feelings of the population, and their indisposition to have anything to say to foreigners, but it would be infinitely worse to have to charge Governments with bad faith, for such a charge must lead to international action, and perhaps to war Geographically, there was not very much for Mr Margary to tell that was not known before, though he had travelled for some distance over a route apparently untraversed by any European, except the Jesuits in the beginning of the last century In 1869, just before he (Sir Rutherford) left China, an Expedition had been sent at his desire up the Yang-tse-Kiang, accompanied by some delegates from the Chamber of Commerce at Shanghai, to ascertain whether the navigation of the river could not be carried on further up than was usually believed? Mr Consul Swinhoe—who, he was sorry to say, was now thoroughly broken-down in health, after a long residence in China—led the Expedition, and, in a little steam-vessel which Messrs Jardine kindly placed at his disposal, went nine miles further up than the *Opossum* gunboat had reached Beyond that, he sailed in river-boats 322 miles, or 750 miles above Hankow. For more than 100 miles of the intervening space, however, he found continuous rapids, with high mountain-gorges, which rendered the stream utterly unnavigable for steamers, even with all the facilities that the Americans have discovered for passing rapids But beyond the point which the Expedition reached in boats, they learned a good deal from Mr Margary's Journal of the state of the country and the utter want of roads, confirming his previous impression, that the time had not yet come when any attempt could successfully be made for opening-up trade with the interior If an officer of Mr Margary's exceptional qualifications and knowledge of the language could not traverse the country in safety, with a special safe-conduct from Pekin, and even with that, eventually lost his life, it was impossible to understand how merchants could hope to reside there, and carry on a profitable trade He considered the time had not yet come when traffic could be carried on there with any advantage, especially from Bhamo, from which place 120 miles of mountain-passes had to be traversed, inhabited by savage tribes, and with nothing like practicable roads. He therefore thought any Government would be justified in hesitating before incurring any serious risk of war and complications by urging the opening of trade-routes from Burmah into China under such conditions

Dr **ANDERSON**, in commencing his remarks, said that it would no doubt be acceptable to the Meeting if he continued the narrative of Mr Margary's journey, by reading extracts from the letters which his unfortunate colleague had written from various places, between the point four marches from Tali-fu, where his Diary abruptly ends, and Bhamô The first letter described his reception at the town of Tali-fu

1 Dated "18th December, near Tali-fu:"—

"On reaching the city of Chao-chow, which is one stage short of Tali-fu, my mandarins begged me to rest a day, while one of them went on ahead to prepare the local authorities for my arrival They represented, with grave faces, that the city populace was unruly and pugnacious, and that I might come to grief unless they concerted measures for my proper escort, and proclamations were first issued to the people describing my position and errand As these ominous words echoed the Viceroy's previous statements, and I had been seriously warned about the turbulent Tali-fu people, there was no alternative but to acquiesce I did so the more readily as we were in a neat *Kung-kwan*, or official travelling quarters, and above all, there were marshes hard by full of duck So next morning early, I took Bombazine and Lula, my two servants, and we trotted off on our ponies, with a yamên runner for guide. . . . . We reached the marshes, and after plunging into paddy-beds and squatting on banks, I succeeded in adding a wild duck and brace of teal to my larder The sun was quite hot, and visions of a plunge and swim in the Tali Lake impelled me to remount and canter away some 5 miles further to the delightful spot Just as we reached the north-west corner of the Chao-chow valley a glorious view burst on our sight through an opening in the hills leading to the Tali-fu plain There lay the city, 20 miles away by road, but seeming so close over the calm blue waters of its splendid lake that half an hour might take me there A backbone of black rocky heights guarded its rear, bathed in colour by the lights and shades of a bright sun's rays playing over its slopes We rode into a large village I was anxious to test the temperament of the country folk Far from ill-will being shown, we were courteously welcomed and fed, without being able to prevail on our kind hosts to accept a single cash I cannot describe the pleasing scene now They got a boat for me, and I chased the wild duck in vain over the magnificent lake, which extends for 40 miles one way and 10 in breadth, cradled in glorious mountains Tali-fu, with its white walls and white pagodas, glistened in the sun over against us I rode back to Chao-chow well pleased with the day's excursion, and set myself to writing my journal and letters. Next day we started, full of anticipations about the famous city But what was my surprise to find, on reaching the halfway town, that the Yung-chang-fu road branched off from there, and that the city lay 10 miles away off the track They took advantage of this, to try and persuade me not to enter Tali-fu, as they were so apprehensive of the people I was not going to be baulked out of so long wished-for a pleasure, and had quite a diplomatic battle with a civil and a military mandarin sent down by the Taotai and the Tartar General to keep me at arm's length They had hired an inn for me, and had prepared a breakfast to delay me, and I was perforce obliged to remain that night (16th) at *Hsia-kwan* But I gained my point, and sent the Magistrate and Captain back with a message that I was bound to pay my respects to the high authorities, and intended to proceed to the city next day for the purpose I felt it all important to break the ice, and open Tali-fu for a visit from the Expedition. Missionaries had lately been driven back from the gates, and it seemed as though the Tali-fu people would have none of us inside their city Well, they could not resist my demand, and next day I started, with mingled feelings of delight and curiosity, escorted by the selfsame Captain who so strenuously opposed my entrance yesterday, and with him a troop of soldiers Four trained-band men kept by my chair, the result was, that I had quite a triumphant day's work The people treated me with respect and courtesy, calling me Ta-jên (Excellency) I went first to the Hsien, or Magistrate, who was a Tartar, and spoke the pure accent of Pekin We were great friends already, indeed, my interview with him at Hsia-kwan had brought about the favourable sequel, for I had told him I did not fear the people, I could speak to them, and soon make friends And when he went back, the high authorities received his report with a great deal of curiosity, and ended by writing down to invite me in I went in turn to the Prefect, who treated me with a very friendly air, mingled with nervousness, for we were equals by treaty, then to the Tao-tai, who was my superior, and he showed it in his manner, although etiquette was strictly observed I knew his style beforehand, for I had made my enquiries too, and knew exactly how to treat him He had been most curious of all to know all about me, and privately expressed high approbation of my qualities, especially at being able to eat with the chopsticks. I went from him to his far greater superior, the Tartar General, and found myself in the presence of a perfect gentleman, who showed an enlightened understanding He was an enormously big man for a Chinaman, and I felt quite small beside him. He insisted on my sitting in the place of honour beside him on the divan—a courtesy the Taotai, a young man, had been too afraid to extend, for fear of damage to his dignity—and asked me innumerable questions about England and Burma. He said, that on my return, he would invite us to stay in the city a few days, at which I inwardly exulted. You may imagine how thoroughly pleased I was at the result of my campaign. Tali-fu understands me, and I have succeeded in brushing away their prejudices On leaving the General's yamen, I was set down in the main street, while my bearers went to find two or three fresh men. The crowd came round me at once, and this dragon, which was set at me to keep me away, proved quite a tame animal I leant forward, smoking a cigar, and chatted most agreeably with the most respectable members of this formidable body. We parted with bows and the most courtly adieux. I feel quite proud of the success of my diplomacy" .

2 From "Yung-chang-fu, December 28th, 1874"

"We left Tali-fu on the 18th The road has been glorious in scenery, and, though passing over high mountain-regions with many steep ascents and declivities, there was nothing so bad to encounter as those horrid passes further back. I cannot, in this letter, give you an account of much, for I am off again to-morrow, and have to engage baggage-animals, receive mandarin visits, and make my official report during the day, far too short for so much expenditure of thought and action Not a breath of the approach of the Expedition can be caught anywhere, so I expect to arrive at our 'rendezvous' first The city of Teng-yueh-chow lies only 4 stages away, and having spent Christmas on the road, I hope, at least, to eat a New Year's dinner at the end of my journey I would have reached this place on Christmas night, but for the alarm of the mandarins at a daring robbery on the road, which they magnified into brigandage, and begged me to rest a day while their troops scoured the hills I was at a pretty little town called Sha Yang, comfortably quartered in the yamên of a petty mandarin who ruled the valley" . .

3. From "Teng-yueh-chow, January 4th, 1875"

"The Indian Mission does not start till the middle of this month, and they wish me to join them at Bhamô I sat up till 3 A M the night before last meditating my proper course, maturing my plans, and writing my despatches Yesterday I visited the mandarins, and arranged all sorts of business. To-day I engage baggage-animals, write my letters amid many interruptions from visitors and business. To-morrow I start again, *en avant*, for Bhamô My messenger, whom I despatched yesterday, is to return and meet me on the savage borders with instructions where to meet the party I cannot explain all the ins and outs, but it requires a good deal of planning to ensure co-operation at a distance. I am perfectly delighted at going farther, and seeing something of these wild regions ahead . I sent my last letter six days ago from the city of Yung-chang, four stages brought us on here, but I spent the New Year's Day, *en route*, at a lovely spot in the mountains. . . .

"Bhamô is seven stages from this, but whereas I follow the nearest route to join the Expedition, we shall pursue a wider track in returning, of which I know nothing yet. .

"The mandarins here are delightfully civil, and my business with them exceeded my best hopes. The Yung-chang ones were the brutes who gave me trouble"

4 From "Manwyne, January 13th, 1875"

"Since writing my last letter of the 4th, from Teng-yueh, or Momien, a frontier Chinese city, I have travelled on five stages through a most interesting country, of which I must give you a hasty sketch. But first I must tell you that my plans succeeded without a hitch. My messenger arrived at Bhamô just in time, and has returned with despatches requesting me to proceed. They have sent a Burmese guard of forty men, under two officials, to escort me back . . They are footsore, and want to rest for two days Yesterday they arrived about 4 P M, and came into my room, squatting down silently to smoke in the most undignified manner They spoke neither Chinese nor English, and so I took them all over to the Chinese commander, who is a famous man, named Li-Hsieh-taî, once a brigand, now a Chinese general, in reward for services against the Mahomedan rebels. Arrived at his yamên, we had quite a conclave There were savage chieftains from the mountains, with whom the General was negotiating a treaty, and notable townsmen interested in the proceedings, besides a crowd of idlers who cannot be got rid of at official interviews in China We sat round in a large circle, the Burmese squatting on their haunches. A long discussion was carried on through an interpreter, which ended in my finding it impossible to get them to move sooner, and had to submit to the delay To-day, however, I have visited Li early, to induce him to give me a guard to-morrow morning, so that I may hurry on and leave my baggage and servants to the care of the Burmese for the following day I cannot yet feel certain that I shall not be foiled after all There are wheels within wheels innumerable, and intrigues going on which require my most careful watchfulness . Li himself, some seven years ago, attacked our last Expedition, and may not be entirely free from enmity But I have a very powerful engine in the will and commands of the great Viceroy at Yun-Nan, who has been an almost unexpected friend and ally throughout Our journey to this interesting town has lain through a lovely valley full of villages, embowered in groves of plantain and bamboo High mountain ranges towered right and left The people are subject to China, but are governed by their native hereditary chiefs They are sociable and amiable, while their striking costumes quite delight the eye with their novelty. The women wear the most marvellous turbans of black crape When I first saw them, I could not help staring right and left at such magnificent beings as their majestic head-dress made them appear A grenadier guardsman would pale beside one of them" .

"*January* 14*th*. . . After spending much energy in trying to 'double' on my dusky guard by persuading the redoubtable *Li* to give me a few men for to-day, I am brought to a full stop by rain The climbing road is impassable in wet, and the Celestial will not attempt anything in a shower The family of my host came round and examined all my things We got very sociable, and I profited by the occasion to study their language a little I got one young scion of the reigning house, who was a pleasant young fellow, to write me down several sentences in their own characters, and we subjoined sounds and meaning in Chinese and English . As it is now clear, I intend to seek exercise with my gun I come and go without meeting with the slightest rudeness among this charming people, and they address me with the greatest respect." . . .

5. From Bhamô, Mr. Margary describes, in a letter, his journey across the Kakhyen Hills

"I had a very novel journey of two days across the mountains which lie between the Shan Valleys, on the China side, and the wide plains of Burma. They are inhabited by the wild Kakhyen tribes, and my rabble guard of forty Burmese was no idle precaution on the part of Captain Cooke We passed through eight or nine of their curious villages, and experienced one or two examples of their bold impudence. My servant, Lin, was menaced by one of these semi-savage brutes with a large stone, which he raised to strike him with, and another drew his dâh—a rough weapon, sheathed only on one side, which they all carry—and made a daring attempt to rob one of my men of his bag. Their long thatched cabins of rattan, peeping out of the still forest here and there, had a strange and exciting interest for us, and the little, scowling, vicious-looking women, eyed us with the unchanged countenance of savages We had a strange lodging that night in the hills We merely travelled on till the sinking sun warned us to halt, and on reaching an open clearing the brave captain of the dusky tattooed army slid off his pony, and pointed me to a low hovel of twigs and dry leaves which some recent occupants had left for the next comers There were three or four ready made, and I enjoyed the look of amazement on Goggle's face when I told him to look sharp and appropriate one for himself before the Burmese anticipated him We crept in on all-fours and spread our beds, adding fresh twigs outside to keep off the heavy dew 'The forty thieves' set to work to build themselves huts, and before long a whole cordon of camp-fires surrounded the gipsy-like lodgings We were astir again by daylight, pursuing our difficult track through dense forest and tangled vegetation, which required both hands to protect the eyes, and both feet drawn up to avoid projecting rocks, whilst one's pony slid down a slippery path, 10 feet at a time The transition from China to Burma, with a bit of savagery between, was most striking . . We descended on the second day, after a long, tedious march, to the jungle-plains of Burma, and trotted off with delighted feelings some 6 miles on the pleasant level to the first Burmese village, where we were put up in a bamboo-house . . . The third day took us to Bhamô. .

"And nôw I have wrung the hands of fellow-countrymen again! It was so delightful to come down from the hills to the Burmese plain and see the semi-Indian civilisation all around Colonel Browne and a string of distinguished officers gave me a hearty welcome, with congratulations on my splendid journey *I am the first European who has traversed the trade-route of the future.*"*

From these letters it was easy to understand the spirit in which Mr Margary set out on his return journey He had accomplished a feat which no European had ever accomplished before, with the exception, perhaps, of one of the Jesuits It was the original intention of the Government that the Expedition under Colonel Horace Browne should proceed to China by one of the three routes which start from Bhamô Those three routes are, first, the Northern, which starts from the village of Tsit-kaw on an affluent of the Irawaddy, named the Tapeng Thence it goes over the Kakhyen Hills, usually in two or three stages, depending upon the road selected, because there are two ways which may be followed—one which strikes down directly upon the small stream flowing from the north-east to the Tapeng, the other, a little further to the south, more along the banks of the Tapeng itself. The second or middle route is the Embassy route direct from Bhamô, crossing the Tapeng River, and making for a little village in the hills called Mattin. This is the route by which all the Burmese Embassies proceed to China There are, perhaps, not so many physical difficulties to be overcome as on the southern branch of the previous route, but the Government deemed it inexpedient that a British Mission should traverse it, from the very circumstance that it was used by the Burmese Embassies, as the Burmese and Chinese might be apt to attach an importance to it which was never contemplated, seeing they might regard the British Mission as carrying tribute to China The most southern or Sawady route was selected as the most feasible, moreover, it was entirely unknown geographically, whereas the northern and the Mattin routes had been fully explored by the Expedition under Major Sladen, in 1868. After Mr Margary's arrival an attempt was made to follow the route by Sawady, but certain difficulties arose which the leader of the Expedition considered sufficient to entitle him to abandon it, and select the Ponline route, which had been pursued by Major Sladen in 1868 From the very first arrival of the Expedition in Bhamô, reports were flying about of opposition to be expected on the other side of the frontier, but little credence was attached to them, because the source from which they emanated was unknown, and, besides, such reports always spring up in similar expeditions. The Mission started for the little village of Tsit-kaw, which they left on the 16th of February They halted one night at one of the guard-houses erected by the Burmese In 1868 there were no guard-houses existing, but since the revival of trade, the Burmese have, for its protection, erected a series of guard-houses from the plains to the banks of the Nampoung, which forms the frontier between the Burmese and Chinese territories. Five such guard-houses have been erected at regular intervals The trade is solely in the hands of the Chinese at Bhamô and Mandalay Some difficulty arose at this guard-house as to proceeding further, because reports again came in that a body of 400 men had collected to oppose them The Burmese officer in charge of the guard was strongly averse to going further, but at last was prevailed upon to proceed to the last guard-house on the banks of the Nampoung, where the Burmese territory ceased The Expedition reached that stream on the following day, and there again heard reports of armed opposition, until, at last, the Burmese officers steadily refused to proceed further until some one had gone forward to ascertain the truth of the rumours Mr Margary, who had recently crossed China with such success, and had been received so well at Manwyne and at Teng-yueh-chow, scouted these rumours, and thought that if there was a body of armed men in front, it could only be a party sent down to assist in taking the Expedition on as far as Teng-yueh-chow It was therefore resolved that some officer should go forward, and as Mr Margary was the best Chinese scholar attached to the Mission, he was deputed to undertake the task, after expressing his willingness to do so He left the Mission on the morning of the 19th, and arrived the same evening at Manwyne, having written a note from Seray, stating that all along the route so far was perfectly quiet, and that the people had been most civil After receiving his letter, the Expedition crossed the Nampoung into China, ascended the mountain range, and encamped on Shitee-Meru. The following morning they attempted to proceed, but were frustrated by the Burmese officer They remained there the next day, when they made another attempt to start, and went on by themselves, without the Burmese, for six miles, but returned at the entreaty of the Burmese officer They were warned that they were about to be attacked, and that a number of men were collected on the heights above for that purpose. The Burmese officer informed them that perhaps they would be attacked that very evening. They did not attach any very great importance to the statement The night passed off quietly. The following morning they were again prepared to start, when two letters were brought to them from the Burmese agent of the King at Manwyne, informing them that Mr Margary had been murdered, and that the Mission was to be attacked at once, and that if the Burmese wished to save themselves they had better sever from the Expedition at once, and put many miles betwixt themselves and the English. About half-an-hour after this, at about 8 o'clock in the morning, a general fire was opened upon the Expedition by the enemy all round the heights. This lasted for eight hours, until about 4 o'clock in the afternoon, when the enemy were compelled to retreat, but only after the jungle, under the cover of which they were, had been set on fire; so that they were burned out. About 5 o'clock the Expedition managed to beat a retreat through the expiring fire along the road which they had come, and they escaped safely into the Burmese territory. The Sikh escort which accompanied them, of course, behaved admirably, but the part which the Burmese played had, Dr Anderson considered, been somewhat overlooked There was a body of a hundred men attached to the Expedition by the Burmese authorities at Bhamô, and they conducted themselves most creditably They drew a cordon around the Expedition, and threw up earthworks, and, during the whole of the fighting, comported themselves quite as well as the Sikhs

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* Other letters of Mr Margary, relating to the same part of his journey, are printed in the 'Proceedings,' vol. xix, p. 288

Colonel YULE said the route pursued by Mr Margary was almost new to Europeans. Although the Yang-tsze-Kiang had been repeatedly explored since 1860, when Captain Blakiston and his party first went up as far as Siuchow, Mr Margary's only predecessor through the interior of Kwei-chou and Yun-Nan was the late Francis Garnier, of the French Navy, who in 1873, a few months before his death, wrote a letter to him (Colonel Yule), describing his journey. He spoke of an extraordinary limestone country which he had traversed, in which the rivers vanished and appeared again. A stream would sometimes bifurcate, and by help of the caverns would absolutely change from one basin to another. He had seen some ten varieties of this phenomenon, rivers even passing one over another (just like railways in the suburbs of London). Nothing could be more difficult to lay down geographically than the network of the River Oo-kiang, which passed near Kwei Yang, the capital of Kwei-chou. Yunnan-fu, the capital of Yun-Nan, was visited by Mr. Margary as the first Englishman, but he had been preceded by M Garnier, with the French Expedition, which ascended the Cambodia in 1867–8 The French were very anxious to proceed to Tali-fu, but that town was then in the possession of the Mohammedans, who were at open war with the Imperialists, who occupied Yunnan-fu The application by the French to be allowed to pass over to the rebel outposts was received with great astonishment and laughter by the Chinamen. However, Garnier made a most extraordinary flank-march upon Tali, and reached it It was one of the most daring expeditions ever heard of, the only one to be compared with it in modern times being that which Sir Lewis Pelly made to the Wahabee capital. Garnier had thrust his head into the lion's mouth at Tali, and the lion was so much astonished that his jaws remained immovable that day, but next morning the tail began to wag, and Garnier took the hint and withdrew, successfully reaching his headquarters at Tong Chuan. Tali-fu stood on a naked plain on the banks of a great lake, with snowy mountains rising behind it, the lake communicating by a short stream with the River Mekong. The natives had a tradition that boats had ascended from the ocean to Tali-fu; but probably that was mythical Tali-fu was the natural centre of nearly all the trade-routes of Western China. In the oldest European map of any scientific pretension, that of Fra Mauro, preserved in the Doge's palace at Venice, dating from 1459, there was a rubric inscribed upon the river in a position corresponding to Bhamo "Here goods are transported from one river to another to proceed into Cathay" That appeared to be the very route by which the Chinese caravans came down to the Irawady, and so to the capital of Burma, until recently Another route led direct from Tali to Ava and Mandalay, through Thein-nee, and he believed it was originally intended that the British Mission should follow that route, but the King of Burma set his face against it. That route had never been explored. There was no other place like that remarkable region in the whole map of the world, with such a congeries of enormous rivers running down within two or three degrees of one another One route from Tali through Yun-Nan struck the upper waters of the Canton River, another led from Tali to the capital of Sze-chuan, perhaps the most civilised part of China That route, as Baron Richthofen had shown, was the one which Marco Polo followed from Chin-tu through a part of what was then Thibet, but which had now become almost Chinese, and then descending upon the great River Yang-tsze, and so to Yunnan-fu, which he called the city of Yachi, and to Tali-fu, which he called the city of Karajang—Karajang being the name which the Mongols at that time gave to the great province of Yun-Nan. Tali-fu was formerly the capital of a great Shan monarchy, and in the time of Marco Polo was not inhabited by Chinese, but by Shans, though it had shortly before been captured by Kublai Khan. From Tali-fu Marco Polo went on to Yun-Chang, which he called Vochan, where there was a remarkable people, who greatly excited his curiosity. He called them by a name (*Zardandan*), which signified in Persian "Gold-teeth" In fact, both sexes wore a case of gold upon their teeth They were also mentioned in Chinese history under a similar name The practice now seemed to be extinct, and therefore the people could not be identified He also mentioned another curious custom, practised by them, that called by modern ethnologists the *couvade* A similar custom was referred to by Strabo as prevailing among some of the Spanish tribes, and by Apollonius Rhodius as among a people on the Black Sea In many parts of the New World the same practice was known The Indo-Chinese country, to which Yun-Nan essentially belonged, appeared dull and uninteresting to those who had not been there, but somehow those who had, became strangely fascinated by its scenery, its customs, and its extraordinary archæology Many things seemed to indicate that great events were centering about that region

The PRESIDENT stated that an interesting paper had been recently received from Mr Ney Elias, one of Colonel Horace Browne's party, who was sent to survey the southern route to which Dr Anderson had referred. He proceeded along that route for a considerable distance, and was on the Shueli River at the time of Mr Margary's death, and, in fact, was received by the Chinese General, Li-si-tahi (Li-hsih-taî), who was said to be the instigator of that deed The Paper would be read at one of the Meetings of the Society during the present Session.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Marco Polo's Six Kingdoms or Cities in Java Minor, identified in translations from the ancient Malay Annals.* By J. T THOMSON, F.R.G.S. Commissioner of Crown Lands, Otago, 1875

[Translation from the 'Salalat al Salatin pertaturan segala raja-raja,' or Malay Annals]

MOREOVER, coming to the traditions regarding the Rajas of Pasé (فاسى), such is the history It is related that there were two brothers called Mara, who dwelt near Pasangan (فساغن), and they were originally from the hill of Sangong (سنكغ). The elder was named Mara Chaka, and the younger Mara Silu Now Mara Silu engaged himself in striking the kalang-kalang fish, throwing them down and striking them again, and so on repeatedly He then boiled the fish, which turned into gold, the scum turning into silver. The process of striking others of the same fish and boiling them, again produced gold as before. Thus Mara Silu obtained much gold And when Mara Chaka heard that his brother tasted the kalang kalang fish he was wroth against him, and would have killed him, but when Mara Silu heard this he fled to the forest of Jaran (حرن). Now the people that inhabited that forest obeyed all his commands, and in one of the narratives of him it is said that Mara Silu went hunting with his dog called Sapasé, when the dog was seen to be chasing something on an eminence, which eminence had the appearance of having been built up by man So Mara Silu ascended the eminence, when he saw an ant as big as a cat; so he caught it, and ate it, and on the place he erected his residence, which he named Samandara (سمندارا), which means Big Ant (*Semut besar* in Malay)

Moreover, it is related that in the times of the prophet of God (to whom be peace) it was foretold by all his friends that in a future period a country to the leeward would be found whose name was Samandara, and it was then directed in this manner "When ye go and hear of the country of Samandara ye must go direct to it to convert its people, for in that country there are many friends of God, but besides this, there will arise a holy man of the country of Matabri (صمنتبري),* him ye must take with ye" Thus, after many years had elapsed, Albani, the Sharíf of Mecca, to whom be peace, hearing amongst the numberless nationalities that came to Mecca of the country of Samandara, ordered a ship to be prepared carrying all the insignia of royalty, which he also directed should touch at Matabri. The name of the nakoda of this ship was Sheik Ismail, so it sailed, and betimes touched at the the city of Rahbi (رهبي). The name of the raja of this city was Sultan Mahomed, and he asked from whence they came, so the people of the ship told him that they were bound for Samandara, "further more (they added) O Sultan Mahomed of the royal lineage of Abubakar, we go forth under the command of the prophet of God himself" When Sultan Mahomed heard this command of the prophet of God, to whom be peace, he created his eldest son as raja of the country of Matabri in place of himself, and he went out along with his younger children, clothing him and them in the garbs of fakirs (holy men), and leaving his government, he came down from his palace and ascended the ship, telling the people of the ship to carry him to the country of Samandara To this they assented with great joy, seeing it was by command of the prophet of God himself So they took him on board, and having sailed, they betimes came to the city of Pasuri (فضوري), where the whole of the inhabitants became converts to Islam So on the morrow the fakir landed carrying the Koran, which he ordered to be read to the people of the city of Pasuri, but there was none amongst them who could do so So the fakir was convinced that this could not be the city spoken of by his prophet Mahomet, the prophet of God, to whom be peace. Thus he returned to the ship of Nakoda Sheik Ismail, and sailing for some time he came to the city of Lambri (لمبري), whose inhabitants were also converted. Here also he landed with the Koran which he requested the people to read, but none could do so, so the fakir returned to the ship, and sailing for a time he arrived at the city of Harad (هارد), where again the people were converted, but on his going ashore with the Koran here also none could read it

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* This is, no doubt, a clerical error for *Ma'abari*, i e the Coromandel coast, see notes to 'Marco Polo'—[H Yule.]

So the fakir asked of the people of the country as to the direction of the country of Samandara, when he was told that he had passed it He then returned to the ship and sailed back, falling in with the land of Perlak (فرلق). This country he also Islamised, when he bore for Samandara, on arriving at which the fakir landed, asking its name, to which Mara Silu replied that the name of the country was Samandara Then asked the fakir, "Who is its chief?" to which Mara Silu replied, "I am the chief of all these people" So the fakir Islamised him, teaching him the Kalimat Alshahadat till he could repeat the same After this, Mara Silu returned to his house and the fakir returned to his ship

Then on that night while Mara Silu was asleep he dreamt that he saw the prophet of God, on whom be peace, when the prophet cried · "O, Mara Silu, open thine mouth" On this Mara Silu opened his mouth, on which the prophet spat into it, on this he awoke from his sleep, and smelt the odour of his body as of spikenard After this, morning broke, when the fakir landed, bringing with him the Koran, which he ordered to be read to Mara Silu Then said the fakir to Sheik Ismail, the nakoda of the ship, "This is the country of Samandar (سمندر) as spoken of by the prophet, to whom be peace"

On this, Sheik Ismail brought on shore all the insignia of government, with which Mara Silu was invested under the name of Sultan Malik ul Salih And in the country there were two men of wealth, by name Sri Kara and Ba Kara, both whom were converted under the names of Ali Gaia nia Aldin[*] and Seid Ismail So Sheik Ismail sailed back to Mecca, the fakir remaining in the country of Samandar to confirm the population in their faith

After this, Sultan Malik ul Salih ordered Seid Ali Gaia nia Aldin to the city of Perlak to make offers of marriage to a daughter of the Raja of Perlak, who had three, two of whom were by a nagara, (?) and one of whom was by a gundek (concubine), whose name was Gangang After Seid Ali Gaia nia Aldin had come to Perlak, the three daughters were shown to him, the two Princesses sitting below engaged in peeling betel-nut, and the one named Gangang sitting above them on a high place, clothed in colours of the rose-water flower, her coat being of the colour of the jambu flower, with ear-ornaments of the young loutar holding a jakalan flower of great beauty Then Seid Ali Gaia nia Aldin came before them, when the Raja of Perlak told him that these were his daughters, two sitting below and one above Seid Ali Gaia nia Aldin with humility said to the Raja of Perlak, "The Princess that sits above, she it is my Prince desires," for he did not know that she, Gangang, was the daughter of a concubine So the Raja of Perlak ordered 100 prows to be got ready to convey the Princess Gangang to the country of Samandar

Now Sultan Malik ul Salih came forth to welcome Princess Gangang as far as Jambu Ayer, and escort her to Samandar in a manner fitted to his mightiness and honour And after arriving at Samandar the Princess was guarded many nights and days till the time of her marriage arrived On the marriage being accomplished, gifts were given to the office-bearers and guardsmen, while a feast was made for the holy men (fakirs) and the poor This being finished, not long afterwards, San Perpatah Pendek (who had escorted the Princess) asked leave to return to Perlak

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[*] ? Ali Gaiash ul din

In due time Sultan Malik ul Salih and his Princess Gangang begat two sons, the elder of whom they named Sultan Malik ul Zahair, and the younger Malik ul Manshur And Sultan Malik ul Zahair they placed under the care of Seid Ali Gaia nia Aldin, and Sultan Malik ul Manshur they placed with Seid Ismail And when they had grown to manhood, Perlak was conquered by enemies from the opposite side of the Straits,* and the population took refuge in Samandar, so Sultan Malik ul Salih designed to found another city Thus he commanded his chieftains on the morrow to accompany him in a hunting expedition, and early in the morning he mounted his elephant, called Permadboan, on which he crossed over (the country), and coming to a beach, the dog called Sapasé gave chase On this Sultan Malik ul Salih came up with the dog, which he found on an eminence affording space for a palace, and suitable in every way to all appearances So he ordered his people to clear the space, which he named Pasé (فاسي), after the name of the dog And Sultan Malik ul Zahair was constituted Raja of Pasé, and Seid Ali Gaia nia Aldin was created mangko-bumi (prime minister), and all the vassals, elephants, horses, and insignia of rajaship were divided, half being given to Sultan Malik ul Zahair, the other half to Sultan Malik ul Manshur, till all were made over to them

The Sultan ul Salih was dry (i e had nothing), so he ordered that all the chieftains of Samandar should come before him in company with his two sons, and after they had appeared before him, he commanded the two Princes, their counsellors, and the chieftains (in this manner) "Oh, my two sons, my confidential friends, all ye, these my possessions I spread before you, so now that I should die it would be well, and I now assemble you to warn you not to be covetous of other men's goods, nor even to allow your thoughts to glance on the wives of our subjects (literally slaves) And it is befitting that you, my two sons, should engage not to quarrel" Then turning to Seid Ali Gaia nia Aldin and Seid Ismail "Oh, my two brothers, do ye watch well over my two sons, remaining by them alone, nor engaging with any other rajas" On this the two (ministers) prostrated themselves, and, weeping, cried, "Oh, our Lord, by Allah, who alone created the universe, we both swear that we never shall withdraw our allegiance to any other princes, but it shall be given to these two alone"

So Sultan Malik ul Salih created Sultan Malik ul Manshur Raja of Samandar, and in three days after this he died They buried him close to the palace there, and the people at this day denominate him as the saint of Samandar

Sultan Malik ul Zahair and Sultan Malik ul Manshur, after the death of their father, collected all their courtiers, their vassals, elephants, and horses, together with their insignia of rajaship (respectively), and the two countries increased greatly in population.

NOTES

The copy of the Malay Annals that I possess, and from which the above translation is taken, is written in the Jawi characters I bought it when residing in Singapore in 1843 The native copyist states at the end of the work that he copied it from papers in the possession of Sultan Abdul Rahman Shah of Johore, then residing in Singapore He gives his name as Faku Hassin bin Ismail, a Bugis of Toh Bilawa, in the year of the Hejira 1243 (A D 1837), but the original work appears to have been brought to Malacca, or Johore, from Goa,

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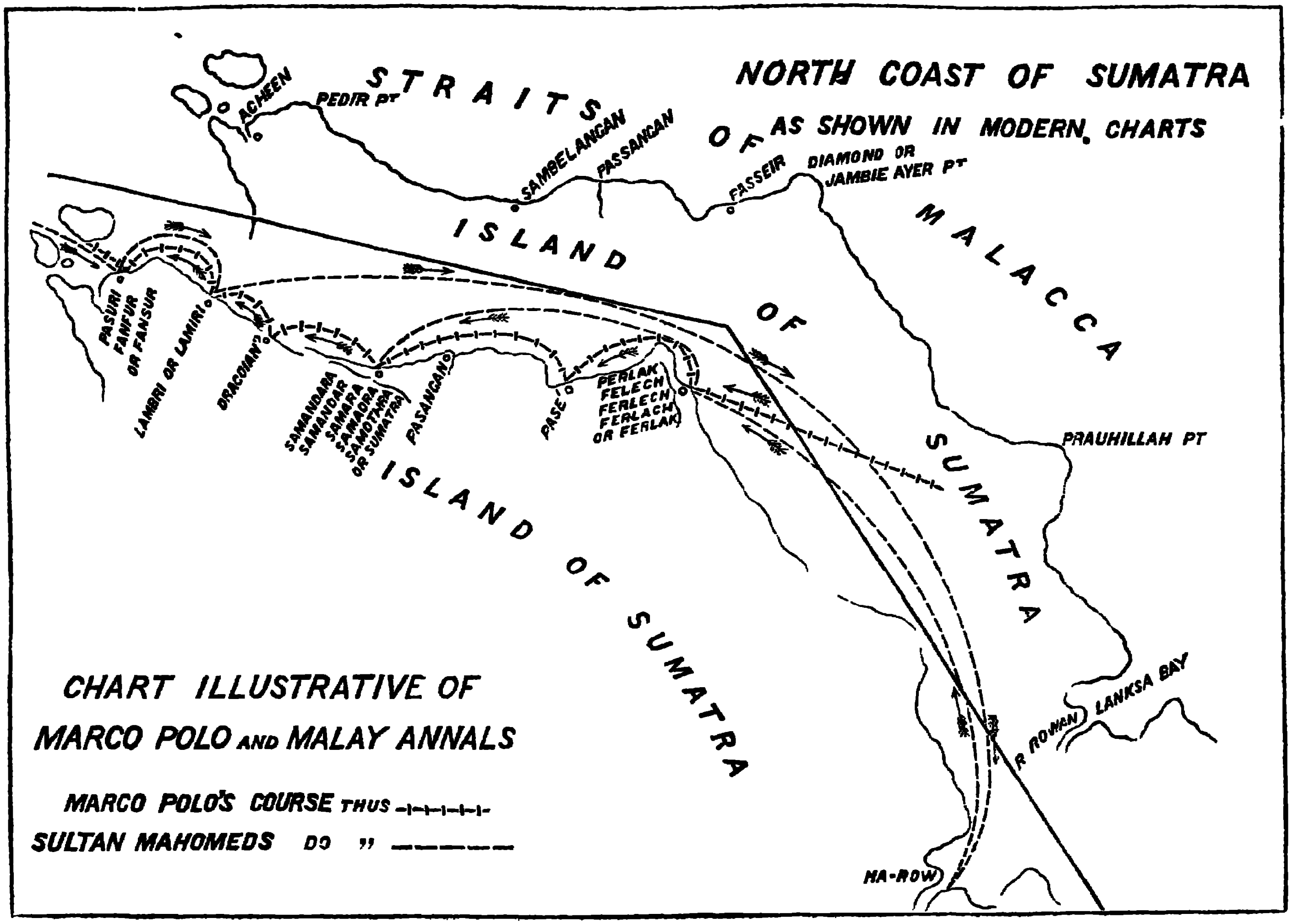
* Probably by Kiddah (*vulgo* Quedda), incited by Siam



NORTH COAST OF SUMATRA AS SHOWN IN MODERN CHARTS

CHART ILLUSTRATIVE OF MARCO POLO AND MALAY ANNALS

MARCO POLO'S COURSE THUS -ı-ı-ı-ı-ı-

SULTAN MAHOMEDS DO " ——————

on the west coast of Hindostan in A D 1604 Goa was then, and is now, the capital of the Portuguese possessions, so it is probable that these Annals, with other spoil, had been removed from Malacca on its capture by Albuquerque from the Malays in 1511, and deposited in the archives of Goa, but returned to the Malay rajas at the above date (A D. 1604)

In perusing my copy I was struck with the names of towns given in these native Annals as having great similarity to those mentioned by Marco Polo; and on turning up the translation by Marsden I was at once led to the north coast of Sumatra, where I had no difficulty in identifying them As anything that bears on the elucidation of the travels of the old Venetian traveller commands attention, I have thought these Notes to be worthy of being placed before our Society

Marco Polo visited the coast of Sumatra about the year 1292, and it is not improbable that the Malay writers date the older portion of their grotesque legends also nearly at that time In these legends, which appear to us to be puerile and fanciful, the natives see much truth clothed under allegory in the mass, but grains of knowledge are yet to be gained by their perusal—as diamonds are found in the mud and sand of the river beds I have not had the advantage of seeing Yule's late edition of 'Marco Polo,' which I regret

By following the Notes closely the reader will see how far the ancient Venetian and Arabic voyagers corroborate each other, and in what manner they correct Marsden and other commentators As a basis of inquiry I append a chart of the coast as delineated by modern hydrographers

1 *Pasé*—A well-known town on the north coast of Sumatra, and which is frequently mentioned in the Malay Annals as a flourishing place, rivalling Malacca in greatness Like this and other cities—it being a mere *entrepôt* of trade carried on between Arabia, Persia, Hindostan, and China, Japan, Java, the Moluccas, &c—it has had its times of prosperity and adversity, at one time populous, at another wasted and destroyed Of its actual position there can be no doubt, it being the Passier of modern charts Marsden, I think, correctly identifies it with the Basman of Marco Polo, and Basma of Ramusio's text, and the Paçem of old travellers, he adds that J de Barros says Pedir was the principal city of these parts before the founding of Malacca; but subsequently to that period, and particularly after the arrival of the Portuguese, it began to decline, and Paçem, in its vicinity, to rise in importance It is distinctly marked as Pasé in the map accompanying Crawfurd's 'Dictionary of the Indian Islands,' 1856, though it seems now to be of so little importance as not call for a notice by him Braddell says ('Journ Indian Arch', vol v p 317) there was a close connection between Pasé and Samadra, almost making them the same country It will be seen by the Annals that it was founded after Samandara or Samara

2 *Pasangan*.—Identical with the Passangan of modern charts, placed also in Crawfurd's map, but not noticed in his text

3 *Samandara* Written thus at first by the Malay copyist, but afterwards as "Samandar" Braddell says it is difficult to discover the date on which the word "Sumatra" was first used, and adds, "Marsden has an elaborate discussion on the subject" In Sanscrit, "Samadr" means "the Sea," in Javanese, "Samudra," "the Ocean" We have seen the Malay annalist's derivation, "Saman-dara," "Great Ant," probably in the native dialect of the coast This is quite in keeping with Malay usage, as we see their settlements called "Kutching" (cat), "Babi" (pig), "Singa-pura," "Lion Town," &c. There can be no doubt of the identity of the various variations, though in corrupting the original the Europeans are as bad as the Asiatics. In Marsden's translation of 'Marco Polo,' it is called "Samara," which he says answers best to Samalanga. Being in the same great bay of the coast, no

doubt it cannot be far from this town, but the remnants or ruins of it will probably be found on an eminence not far inland, as described by the native annalist All that I can adhere to is to place it in the same bay in which Samalanga is situated.

In the copy translated by Dr Leyden, of which I only have extracts by Braddell, the word is given as "Samadra" Crawfurd, in his 'Dictionary,' states that the first (European) writer that gave the name as we now write it, viz "Sumatra," was Ludovico Barthema, in 1505 This was an easy variation from "Sumothra," as the same place was called by the Arab navigators who acted as pilots for the early Portuguese adventurers.

The town of Samandara, Samandar, Samara, Samadra, Samothra, or Sumatra, had been the most important on or previous to the arrival of the first European navigators of the fifteenth and sixteenth centuries, so they had given its name to the whole great island, as we talk of the Peninsula of Malacca at the present day, though Malacca has fallen now to the condition of a village, while Singapore has risen to that of a city.

4 *Matabri* * By Leyden's translation called "Matabar." Supposed by Braddell to be a corruption of Maabar, on the Coromandel Coast, Hindostan

5. *Rahbi* Lane, in his notes on chap xx, 'One Thousand-and-One Nights,' states that Mahomedan travellers of the ninth century mention an island in the Sea of Harkend (Indo-China) as being called "Ramni," also as "Rahmi," which was 800 leagues in compass. Hence he makes no doubt that the island called by Arab geographers "Raminee," "Ramiri," "Ramee," &c, is Sumatra. The Rahbi here evidently is the city of the country of Matabri, Matabar, or Maabar above, and not the Rahmi or Sumatra, though the identity of expression is so close

5 *Pasuri* This, as the first town that was arrived at after leaving Hindostan, and the first that was converted, must be placed on the north coast, island of Sumatra Braddell, with local knowledge, denotes it as Fansur on that coast, but does not give its actual situation In 'Marco Polo' it is called "Fanfur." Marsden says that some suppose it to be Panchor, on the east coast; but he inclines to think it intended for Kampar, both near the south-east end of the Straits of Malacca. As the native annalist undoubtedly makes it the first town arrived at from the west, so it must be near to the site of the modern Acheen, or Aché So I place it accordingly

6 *Lambri.* Also named "Lambri" by Marco Polo. Marsden says it is so called, without any variation, in the several editions, excepting in one place, where it occurs in the early Latin as "Jambri." He identifies it with Jambi, on the east coast of Sumatra, not far from the Straits of Singapore. It is not noticed in Crawfurd's 'Dictionary' It is called "Lamiri" by Leyden, and Braddell agrees with the native annalist in placing it further east than the last (Pasuri) I am inclined to make it the same as the Raminee or Rahmi, above quoted, of Arabic geographers of four centuries before the times of Marco Polo, at which period the constant fluctuations of trade and fortunes of war may at that time have made it the most important city in the eyes of the Arab traders, and who would thus call Sumatra the land of Rahmi or Lambri.

7 *Harad* This, no doubt, should have been written as "Harow," the letter *dal* (د) having been misplaced for the letter *wow* (و) by the native copyist If so, the city of Harow was on the river of that name in Lanksa Bay It is common for the Malays to affix and suffix particles to their roots, as "Harimau" or "Rimau" (a tiger), or "tau, tau-an" (knowledge).

8 *Perlak* Called in Leyden's translation "Felech," and as such it would be pronounced by his Arab pilots Marsden says that in the Latin edition it is named "Ferlech," and in the Italian "Ferlach," equivalent to Ferlak

The place can be of small consequence now, as it is not mentioned in Crawfurd's 'Dictionary' Braddell says Perlak is Diamond Point This point is called by the Malays sometimes "Tanjing Perlak," and sometimes "Tanjing Ayer Jambu"

We are now in a position to follow the wanderings of the Mahomedan missionary Sultan Mahomed, as described by the Malay annalist Coming from the west, he first touched at Pasuri, Fanfur or Fansur, then proceeding, he touched at Lambri or Lamiri, then proceeding, he was carried past his destination, as far as Harow, where he touched Finding his error, he proceeded back, touching at Perlak. From thence he bore back, till he arrived at Samandara, Samandar, Samara, or Samothra, the Sumatra of Europeans, whose position was near Pasangan, and across the country (or intervening point), as stated by the native annalist from Pasé.

Now we may follow the voyage of Marco Polo with intelligence. And in the first place we must note that he came from the east, not the west, as the Mahomedan Coming into the Indian Archipelago from China, he says, "You reach the island of Pentan," which is no other than Bentan, as it is pronounced by the Malays at this present day, though it is called "Bintang" by Europeans, "then proceeding 30 miles further, you arrive at an island, in itself a kingdom, named Malaiur," which is no other than Singapore, or, pronounced by the Malays, Singapura, the ancient capital of the Malays or Malaiurs of old voyagers, existent in the times of Marco Polo From Pentan or Bentan, he states, Java Minor, or the island of Sumatra, is distant 100 miles, but he mentions no kingdom or city in it till he arrives at the kingdom of Felech or Perlak. And this is just as might be expected, as the channel in the Straits of Malacca leads on the north-eastern side out of sight of Sumatra, and the course, after clearing the shoals near Selangore, being direct towards Diamond Point, near which we have seen the town of Perlak, is situated. Thus we see that the Venetian traveller describes the first city or kingdom in the great island that he arrived at He continues "Leaving the last-mentioned kingdom (Perlak) you enter that of Basman" This we have shown to be the modern, as well as ancient, Pasé, which is situated on his course westerly And then he again says "Leaving Basman you enter the kingdom of Samara," again westerly on his course, and situated relatively to Basman or Pasé, exactly as described by the Malay annalist

Next he mentions Dragoian, supposed by Marsden to represent Indragiri, on the east coast, near Banka, but from the context, and following Marco Polo's course, we would place it west from his last city or kingdom Samara, and we make no doubt, if the name is not much corrupted, it may yet be identified in one of the villages of the coast at this present time

And here we come to find the value of the Malay annalist's assistance, for Marco Polo next mentions, as the fifth kingdom, Lambri, which place we have seen that the Mahomedan missionary touched at before he passed Samandara or Samara Thus in this there is a corroboration of testimony, that by the Malay annalist, Lambri was west of Samara, consecutively it was also westerly from Samara by Marco Polo's enumeration.

Fanfur, Fansur or Pasuri, is the last kingdom named by Marco Polo, and the first by the Malay annalist, and as it is known to modern geographers, this corroboration doubly settles the identity and position of all Thus all the six cities or kingdoms mentioned by Marco Polo were situated on the north coast of Sumatra, now commonly known as the Pedir Coast He said he visited these, and the Malay annals prove that he has noted them with unimpeachable accuracy in their relative positions. This could not be said if the comments of Marsden and others are followed, who place their kingdoms in different parts of the island. It will be noted that the Venetian tells us that there were eight kingdoms in Java Minor, or the Island of Sumatra; but he adds, that "he will describe the six that he actually visited, omitting the other two, which he had no opportunity of seeing" The positions of these six, then, I think I have now unquestionably settled *

2.—*Notes of a Visit, in May* 1875, *to the Old Calabar and Qua Rivers, the Ekoi Country, and the Qua Rapids.* By Captain JAMES BROOM WALKER, F R G.S.

I. VISIT TO THE OLD CALABAR RIVER.

On the morning of Monday, March 8th, 1875, started on a trip up the Calabar River, calling at the villages of Ikot-Mba and Adiabo, where there are Mission Stations supplied by native agents from Creek Town, and after visiting the first Ingpara hamlet, we came to Upper Ingpara, where we spent the night The headman of the village received us very courteously, and gave us lodgings This is the last Calabar town up this river, but a good many Creek Town people have farms along the banks of the river as far up as Uwet

Pursuing our course next morning, we passed a village of the Aukanyong people, which we visited on our return and found pleasantly situated This is a tribe originally from Aurandop, and inhabits a narrow strip of land running across the peninsula between this and the Cross River A little palm-oil is made, but the people occupy themselves chiefly in raising food The want of confidence between them and Calabar, resulting from a war several years ago, has till now shut against them their principal market

Farther up, we passed the Odut Creek, a small inlet which goes into a district of that name Another creek entering from the Cross River a little above Ikunetu is almost conjoined with it in the rainy season. The people of Odut are a mere handful of emigrants from Ibibio Here on both sides of the river for a considerable distance lie the farms of the Creek Town people, occupying land formerly belonging to Uwet, purchased by King Eyo II in following his policy of planting his people here and there throughout the country on the banks of the river, so as to spread his power The elephant is found in this district The natives never venture to attack him, but when numbers come out of their haunt to plunder the farms, the people drive them off by fire and noise

At a farm hamlet called Aqua Efe we rested, and prepared dinner Again taking the boat, we pursued our way, the river being now a narrow stream and the channel much intercepted by trees and sand-banks About dusk we reached Uwet, and took up our quarters in the Mission Station recently formed here

The people of this quarter are originally from Akuna Kuna on the Cross River From that an attempt was made in former years to get a direct trade with the European ships frequenting the Calabar River, but the people of Umon, who have planted their town on an island in the middle of the river, so as completely to command it between Akuna Kuna and Calabar, blocked up the way This led some of the people of Akuna Kuna to pass over towards the other river, and a number of these found a settlement at Uwet, inhabiting three villages called Uwet, Ikpit, and Ewen These were formerly much larger than we now find them, but their heathen customs of blood, especially the frequent use of the poison ordeal, are wiping them off the face of the earth We trust that the Gospel now taught them by the native agents from Creek Town, who occupy this station, may be in time to save them. After taking observations next day, we took boat to the rapids, which close even canoe navigation They lie a short distance from the town The river flows between steep banks of considerable height covered with forest, said to be the haunt of the chimpanzee, its channel filled with rocks and boulders, and at one place there is a fall of about 6 feet. Those going into the interior towns, leave the river here and strike off up the face of the steep bank on the right bank.

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* Mr Thomson, as he mentions, has not seen my edition of 'Marco Polo,' nor, apparently, a paper on the subject of these kingdoms by the late Mr. J R Logan, in his 'Journal of the Indian Archipelago,' to which reference is made in the notes to 'Marco Polo' In the said paper and notes the quotations and conclusions of Mr Thomson have been anticipated, and *Fansúr* also, which he leaves undetermined, identified —[H. YULE]

Farther up amongst the hills three small streams unite to form the river The hippopotamus is not found in it as in the Cross River, but the crocodile abounds in both.

II. Visit to the Qua River.

Monday, March 22nd, 1875 —This morning set out on a voyage up the Great Qua River, which enters the Cross River below James Island. Our first day's travel was up the wide river, bordered by the usual low swampy ground covered with mangrove forests Of the mangrove, which is so great a boon to these rivers, by drinking up the miasma of the swamps, the Calabar people name three varieties The rarer species, not common on the upper courses of the river, we found here In the evening we made Qua Landing, which is but a few miles behind Duke Town, overland, and took up our quarters for the night. The village here belongs to the Qua people, but, as it is a port for the Duke Town people in going to and coming from their farms in Akpabioyo, a number of Calabar people are always found about it The headman declined to receive us for the night, never having accommodated white guests, and having no place in his house which he thought would suit. In our dilemma, a young man, who had formerly been to school at Old Town, got accommodation for us in the yard of a pleasant-looking old man, with whom he seemed to be connected

Resuming our course in the morning, we passed by the landing for the Cape Town farm, which lies several miles off the bank of the river in a hilly region, and which time did not permit us to visit Proceeding, we rested for our mid-day meal, and the flow of the flood-tide, at a small farm belonging to an Old Town man, who gave us his name as Kofi Robert His principal farm was about a mile over a hill, and hearing of the arrival of white men he came down to see and invite us up to his house We accompanied him thither, and on returning recommenced our progress up the river

We passed on our way various farm beaches, and after a weary pull, about dusk reached an Old Town hamlet, the farthest up the river. A bank of shale here projects itself into the river, having the appearance of a wharf and serving the purpose of one On our arrival we sent up to the village to announce our presence, and the headman, Efium Cobham, came down to meet us, but was evidently afraid to receive us, saying "We are slaves of the white man, there is the village, go take it" He no doubt suspected that he might be called in question by the Calabar authorities for giving us accommodation, they being not at all desirous that strangers should penetrate the country At length we got into a house, and established ourselves for the night, our every movement, as usual, being closely watched by the people, whose curiosity was greatly excited by the unwonted visit of a white man.

We set off in the morning to get up to the rapids, if possible The people assured us we should not be able to proceed so far in a boat, and we, after rowing two or three hours in a channel rendered intricate by trees and sandbanks, found this to be the case About noon we were obliged to retrace our way to the village we left in the morning, the rapids still several miles beyond the farthest point reached, though quite accessible in a canoe

The Qua River descends from the range, proceeding interiorly from the Cameroons, part of the range sometimes getting the name of Rumby

Possibly the Cross and the Cameroon rivers may have their source in the same range. The region through which the Qua flows, including that now occupied by the Calabar people of Old and Duke Town, was, and for the most part still is, in the possession of the Qua or Aqua people They are of the Ekoi tribe, which inhabits a wide region traversed by the mountain range, going over probably as far as the country watered by the Cameroons. This tribe in past times traded with Calabar in slaves, but now farm-produce and a small quantity of ebony are the articles of their traffic

III. VISIT TO EKOI.

Thursday, April 15th, 1875—Proceeded from the Hulk *Dawstone* at 1 P M. to Adiabo, arrived at the above place at 4 P M, and remained all night at the United Presbyterian Mission House of the station here.

Friday, 16th.—At 8 50 A M started for the Ekoi Creek above Small Inkpara, on the left bank, at 4 30 P M, arrived at Aukanyong, landing at the head of canoe navigation, after a long and tedious pull through a very intricate channel Found at the landing a shed erected in charge of an Aukanyong man, who kindly offered to take charge of the boat, &c, until our return I gladly accepted his offer, and at 5 P M started part of the caravan for Aukoyong Village, distant in a north-east direction 1¾ mile. At 7 P M. I started with the rear of the caravan, and arrived at the above village at 8 P.M. Found the chief of the village had prepared dinner. The village stands on a hill, and is beautifully situated The road from the landing to this place is up a hill and very rocky. Passed a stream, running east and west, about a mile from the landing, which I found to be a continuation of the Ekoi Creek This village is inhabited by a portion of the Aukanyong tribe, who seem to have the gift of spying out the best land for farming. The chief produce of this district consists of yams, plantains, Indian corn, and palm wine Useng is the name of the chief of the place, and I must state here he treated us with marked kindness, and supplied us with carriers to the next village

Saturday, 17th—At 9 50, after taking observations for longitude, started for Okino Village in a E N E direction, passing down hill Found the road very rocky, and at 10 15 came to a cataract, which runs into the Ekoi Creek below the Aukanyong Landing. Halted for twenty minutes to bathe, started at 10 35 for Okio Village through a dense forest up and down hill, with stones and rocks abounding The forest trees prevented the rays of the sun reaching us, which made the travelling very pleasant. At 11.25 arrived at the above village and engaged new carriers

The chief of the village being at his farm, we left a small present and made a short halt This village is also very pleasantly situated on the summit of a hill on a clear patch of ground. The people who inhabit this town are part Efik and part of the Ekir tribe. Their chief occupation is raising food—yams, plantains, and Indian corn, india-rubber is found here, but it is only used as bird-lime

At 11 40 started in a north-west direction down hill, through a dense forest, with stones, rocks, and streams abounding After passing eight streams, we ascended a hill and reached Asuquay, a Calabar village, situated in a clear patch of land, the farms lying in all directions round the village. This village is inhabited by the Ekoi tribe principally, and their chief occupation is raising yams, plantains, Indian corn, and live-stock—goats and fowls. The chief of this village is dead. On our journey in a north-east direction passed a yam- and corn-field, stones and rocks abound, but the farmers plant all around, and leave them where nature has placed them. Passed on through a jungle for a mile, which was less pleasant than the forest, the rays of the sun scorching us and making the walking very unpleasant. At 1.55 arrived at Krut Enim, or the Elephant's Head, a clear patch of ground in the dense forest, where the inhabitants of Mbareikom Town killed an elephant, hence its name. At 1.56 proceeded in a north-east direction down hill, and at 2 P.M. reached a stream. Halted, and bathed here, and at 2.20 started for Mbareikom Town, situated in the centre of the Ekoi country. At 2.30 arrived at the above-named town, and were received by the people with great joy, at seeing white men visiting their country in company with the Rev. Esien E. Ukpabio, their future teacher and pastor. This town is situated on a hill, and will be the chief town in the country. The people here raise food—yams, plantains, and corn—and supply the neighbouring tribes, Calabar, &c. The chief products of this country are ebony, india-rubber, and kola-nuts, and a nut which makes a butter somewhat similar to the Shea butter. The United Presbyterian Mission has placed a station here, which was much needed. The whole of the country lying east and west from the banks of the Great Qua and the Uwet rivers, bounded on the north by the Uyanga tribe, and on the south by the Calabar people, has not had any communication with Europeans direct, nor have they been visited until very lately. This country is teeming with population, and ripe for a Mission Station. This will in some future day be the basis of a line of stations far into the interior, reaching the banks of the Chadda River, and striking direct across the continent to the Red Sea.

Sunday, 18*th*.—At 9.7 P.M. we observed the meridian altitude of the star Dubho, to determine the latitude and to enable us to start at noon the following day.

Monday, 19*th*.—At 7 A.M. walked a short distance in a northerly direction to see a large tree which produces a nut that makes a butter like the Shea butter. The tree was not bearing, but found a specimen of the nut lying on the ground. This is the only tree of the kind in the district. The tree producing the kola-nut grows extensively, and might be made an article of future trade. Returned, after passing through a village near Moarekono. Took observations of the sun for longitude at 9 A.M. At 11 A.M., after being shown great attention by our host, whose name is Itaokpo, we started for Aukanyong village, and reached there at 9.35 P.M., when our kind host prepared dinner for us, and we rested for the night.

Tuesday, 20*th*.—Started for Aukanyong Landing and embarked for Adiabo; reached there at 4 P.M., and rested for the night.

Wednesday, 21*st*.—After breakfast started for Creek Town, and arrived there at 1 P.M. Proceeded to the *Dawstone*, arrived at 2 P.M.; making the journey in 7 days.

IV. VISIT TO THE QUA RAPIDS

Monday, May 3*rd*, 1875.—Started at 5 A.M. for the rapids of the Great Qua River. Proceeded towards Creek Otip, 1 mile below Henshaw Town, and entered the mouth of the Creek at 6 A.M., and passed out into the Qua River at 8.10 A.M. Proceeded on our journey, and at 10.40 A.M. anchored below the Duke Town Landing to breakfast. At 11.20 proceeded on our course, and arrived at Archibong Willy's of Old Town farm-beach Landing. At 2 P.M., 1 mile above Kofi Robert Landing. At 3.30 started for Archibong Willy's plantation, up hill, in a south-easterly direction, and passed Kofi Robert and John Anderson's farms, lying to the right. Changed our course to east by south, going down hill. At 4.10 passed Hogan Archibong's plantation. Bearing south by east, at 4.20 came to Archibong Willy's head slave's farm on a hill, halted for 10 minutes. At 4.30 proceeded down hill in a north-east direction, and at 4.35 passed a large yam- and corn-field to the right and left; and at 4.40 passed Effiong George's plantation to the right, going up and down hill. At 4.50 arrived at Archibong's plantation, of which I estimate the distance from the landing to be 4 miles. The whole of the road from the landing to the plantation is shaded with tall forest-trees, except when you approach the farm, where the ground is extensively cultivated for a mile in extent round each farm. The soil is very rich and productive, and well watered with streams. The chief products of the district are yams, Indian-corn, and plantains. At 5.30 Archibong and his farm people, hearing of our arrival at his house, walked in to welcome us, which he did in a most cordial manner.

May 4th.—At daylight, after coffee, our host invited us to look at his yam- and corn-fields, which lay in an E.S.E. direction from his house, up hill, for 2 miles in extent, all cleared ground and under cultivation. Estimated the people at this farm to be no less than 100 persons—men, women, and children. Taking on an average 50 persons at each of the other four plantations which we passed, and at one 2 miles further in the interior, making a total of 350 persons at work on these farms.

At 12.30 obtained a guide from Archibong, and permission to occupy his farm-house situated immediately above the rapids, on the right bank of the river. Took farewell of our kind host, and proceeded for the landing. At 1.50 arrived at the landing. At 3.35 started on our journey with the flood-tide. At 4.50, pursuing our course, passed some patches of elephant-grass and wait-a-bit thorns on the left bank, and on the right bank passed several fine bombax-trees. At 6.15 arrived at Obutong, our old quarters, and after dining, rested here for the night. Cobham Effiong was the headman of this town, but he has been dead for some time, and now his head slave occupies the town. We found him suffering from a sore leg. He was unable to move about, however, with our guide, who is a free young man, he made us very comfortable.

5th.—At 6 A.M. proceeded on our journey for the rapids. 11.35 anchored for dinner abreast of an Ekoi landing. We saw here several Calabar canoes taking in ebony on the left bank. Found the river much higher than when last here, the sand-banks being completely covered, giving the river a wider and more beautiful appearance. Passed two islands, to the first of which I gave the name of Grant, and the second I called Bates Island. 12.35, proceeded on our course. At 1 P.M., on nearing the right bank-head, heard a rushing of water and roaring, but could see nothing. Stopped pulling, and hauled the boat close into the bank, and found a small creek, with a fallen tree lying directly across the mouth, stopping ingress and egress. The roaring of the water became more distinct, so determined to ascertain what it was. The bow-oarsman was ordered to clear the brushwood, and I landed and walked about 40 yards in a direct line from the beach, and beheld a cataract with a fall of 100 feet, the water falling over the immense cliffs, and rushing down the rocks with great rapidity into a basin beneath. I stood for a few minutes and sketched the fall, which was magnificent in the extreme, the trees shading the water on both sides making the scene a truly picturesque one. The cataract is about 2 miles below the rapids on the right bank. After picking up a few specimens of stones from the sides of the basin, we proceeded, and at 2.15 arrived at the lower rapids, the width of which we determined to be 100 yards, with a fall of 20 feet. Landed at Archibong's beach, and was received by the inhabitants with shouts of joy. Walked along the right bank, which is within 200 yards of Archibong's farmhouse, situated on a hill immediately above the rapids, and beheld another fall of 50 feet. The rushing of the water was exceedingly grand, the land rising almost perpendicularly on both sides, forming an immense gorge, which bears the mark of a great rise of the river during the rains, with the primeval forest-trees overhanging the banks of the river, causing a shade, and, together with the mist and roaring of the water, making the surrounding scene one of surpassing grandeur.

The height of the banks I estimated at 300 feet above the rapids on both sides. Walked up the steep cliffs in a north-west direction, and reached Archibong's farmhouse, a distance of half a mile from the landing, close to the lower rapids. It struck me at once that this would be the place for a sanatorium for the Old Calabar Mission, and if Mr George Thomson had selected this spot for his site, instead of going to Cameroons, he would have been wise.

6th.—At 6 A M King Abasi of Oruk, of the Ekoi people, with fifteen followers, arrived at our lodging from the opposite bank, where his town Obutong Ekoi is situated, to welcome us to his country, and offer his services as a guide to visit the upper rapids on the opposite bank. Proceeded with him across the river opposite Archibong's Landing, and climbed this steep cliff of 300 feet, and then proceeded on level ground for 2 miles in an E.N.E. direction, until we came to a yam- and corn-field, when we altered our course to due north, and, after walking a mile, struck the cliffs immediately over the higher rapids. Descended the cliffs in a slanting direction, holding on to the roots of trees, until we found ourselves at the bottom of the greatest fall of the higher rapids, the fall which the King declared to be the highest. I estimated it at 100 feet. Walking over the immense boulders until we saw the fall right before us, we sat down to witness the surrounding scenery, which was too grand a sight for my pen to describe. Picked up a few stones and commenced our return, when we found it absolutely necessary to take off our boots for fear of tumbling into the gulf of water immediately below us. The foam, and mist, and roaring were confusing, and the slippery nature of the boulders made it difficult for us to move about. On our return we passed a number of villages, his Majesty remarking that he was "King for them all." He insisted that I must visit his town, which I did, and was received with shouts of joy by his people. He remarked that it was difficult to keep goats, on account of the leopards prowling about night and day, and carrying them off. The people of the district raise yams and plantains for their own consumption only. Their chief occupation is acting as brokers between the Calabar people and the hill-people, the latter preparing the ebony for exportation. Found a Calabar man here buying ebony from King Abasi Oruk, who buys it direct from the hill-people. And so the trade is carried on from one to the other, each making profit sufficient to provide for his wants, which are few indeed. The town is built like Calabar towns, of mud walls, and roofed with bamboo-mats. Started for the Ekoi Landing, and crossing the river, arrived at Archibong's Landing at 11 A.M. Three Ekoi people came, sent as a deputation from their King to invite us to visit his town, and another, and much larger fall, at some distance from this place, which I supposed they must have meant the fall of the Cross River, which bears north-east by east, distant about 30 miles, according to the position Captain Beecroft marked the rapids on his chart, but declined at present. With some aid from the Society, I would be glad to give the position of the higher rapids of the Cross River, if it was thought of any moment to know the exact position.

At noon started on our home-journey. At 4 P.M. arrived at Obutong village, occupied by Old Town people, took in some boxes, &c., which had been left behind to lighten the boat, and then proceeded. Arrived at Archibong's Landing, 1 mile above Kofi Robert's, landed and walked out to his farm to pass the night

7th.—At noon started to visit all the Old Town farms on the road. The day being clear and fine, saw a range of hills from Kofi Robert's farm, sketched the range, and proceeded Left the landing at 2 P M, and arrived at Okom at 5 P M, where I took up my old quarters and rested for the night

8th.—Started at 6 A M, and proceeded through Olip Creek, and arrived at the *Dawstone* at 2 P M, making the voyage in six days.

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3. *On the Discovery of a Boiling Lake in Dominica.* By H. PRESTOE, Botanist, Trinidad.

[Communicated by the COLONIAL OFFICE]

THE Surveyor-General, Dr. Nichols, and myself, started in the morning from Roseau, and reached the first souffriere in the Souffriere Valley the same evening Here we constructed "adjupos" for the night, the Boiling Lake being nearly two hours' walk further on, and which we reached the next day about one, having examined the several souffrieres of the valley *en route.*

Our route lay *viâ* the district at the head of the Roseau Valley known as "Landats," and across the southern portion of the Coliabone range of hills, and the three or four branches of the "Mirale" River, south-eastward, thence up the most southern of the branches of the River "Mirale" a little southward, and finally up its south-east branch to the head of the Souffriere Valley, thence down the Souffriere Valley and up a minor valley north-westward to the Boiling Lake

One of the ridges in the Coliabone range was traversed at an elevation of 2475 feet by aneroid, but the route presented no particular difficulties until the upper part of the most southern branch of the Mirale River was reached, and here, on account of the precipitous hills on both sides of the watercourse, much obstructed by huge boulders, this had to be followed to the head of the Souffriere Valley, elevation 2680 feet.

At this point the passage became excessively difficult and dangerous from the precipitous character of the hill-side, down which it was only possible to proceed by clinging to the tree-stems. Reaching the watercourse of this valley the route continued down it, and again up that of the minor valley leading north-westward to the Boiling Lake, the difficulties of the last portion of the route being increased by the large volume of very hot water coursing down from the innumerable "Souffriere" issues higher up

The nature of the Boiling Lake is, I believe, exactly the same as that of the many "Souffrieres" in the adjoining valley, and those I have seen at the head of the Roseau Valley. It differs from them only in size and position. These smaller souffrieres are all aqueous solfataras, with, apparently, an excess of ejective power (exerted by their gases and heat) over the water which effects them, and which drains from the adjacent hills The Boiling Lake is a gigantic solfatara, with, apparently, an excess of water over the ejective power exerted by its gases and heat. In its case the water affecting it flows in from two converging ravines, which meet on its north-west corner in very considerable volume

The action of the solfatara, together with the existence of a small hill immediately opposite the point of ingress of the water, have caused the formation of a crater-like cavity with precipitous sides, on the north-east and south-west, of some 60 feet depth to the water's edge. The depth of the lake, a usual with such formations, appears to be indefinable, since I found no bott at 10 feet from the water's edge with a line of 135 feet length. The tempe ture of the water was found to be from 180° to 195° Fahr

The outlet for the water, which is of a deep grey colour from the presen of decomposed rock and sulphur, is by a ravine running south-east, and whic already with deep precipitous sides, is continually deepening The surface the lake is thus necessarily being correspondingly lowered, and with th process the lake will be, and apparently not long hence, destroyed by tl complete drainage that will be effected by the deepening of the ravine.

The removal of the existing large body of water over the solfatara wi probably change the character of the Boiling Lake into something like that a geyser should the solfatara continue active. Then will follow a gradu filling up of the cavity by the reduction of the adjacent hill-sides, which simultaneously with the change of direction in the watercourse or its dissemi nation, will create many small solfataras in the place of the large one. Th there can be no doubt, from the evidences which exist in the locality, has bee the process by which the present conformation of the district has been brough about, and that too quite recently

The most distinct evidences of this process exist at the head of the mino valley leading to the Boiling Lake, the chief of which are precipitous an barren hill-sides, a great width of valley bed, consisting of decomposed roc and huge boulders, amongst which are innumerable solfataras and rivulets and lower down in the ravine, where the disturbance has been less extensiv flows the heavy stream of hot water heavily charged with sulphur and decomposed rock

The state of ebullition in the Boiling Lake is confined to one point at th south-east part of the lake This of course communicates a constant an violent agitation over the whole surface The elevation of the volume c ejected water is usually two or three feet, but it occasionally rises a foot c more higher It is also seen occasionally to divide into two or three distinc cores as though being ejected from as many orifices There was no escape c gas or steam noticed beyond what arose from the surface of the water generally

On the north and west and south-east sides of the lake there is an accumulation of rock débris above the water's surface, which was reached with difficulty down the precipitous sides, and from which I applied the thermometer The hot sulphurous vapour was of course overpowering, and has had a deadl effect on the trees hard by This destruction of some of the trees (*Clusias* around the lake would indicate that its power has lately increased, as otherwise they would not have reached their present dimensions. I noticed th same effect about the other souffrieres in the neighbourhood

The hill-sides in the two Souffriere Valleys are to a great extent very precipitous and barren, conditions which are obviously due to comparatively recen action of the many souffrieres These surfaces are very sparsely covered wit one or two species of bromelia, mosses, and ferns, as a first step probably t their being reclothed in forest verdure.

I may mention that one of the important effects due to the action of thes souffrieres is the development of various kinds of gypsum in process of decomposition of the volcanic rock Some large masses were seen (and sample collected) of a kind strongly resembling the Volterra or Tuscany marble.

Samples illustrative of the process of the rock decomposition, as of the lak and hot steam-water, the various forms of sulphur, &c, I have brought wit me for future examination, and with regard to the Boiling Lake itself, I regar it as quite unique, and of the highest importance to geological science.

On the third day out (Thursday) the Surveyor-General and myself explore the hills on the north side of the Souffriere Valley, and succeeded in finding [illegible]er and altogether better route to the Boiling Lake. Later in the day the [illegible]veyor-General succeeded in finding a continuation of the new route north-[illegible]st, so that all the difficulties of the Soufriere Valley, the two chief, as [illegible]eady mentioned, being the hot-water ravine and the frightful precipice at e head of the Souffriere Valley, are now avoided There now remains about one mile of seriously difficult route, being about half a mile the homeward side of the last-mentioned precipice, and ending at the foot of the Cohabone Olange south-eastward, where the most southern of the branches of the Miale iver is left. Want of time and very bad weather prevented us examining this portion of the route beyond what could be done in traversing it, no unusual difficulty exists for the construction of a bridle road from "Landats" to e Boiling Lake.

It is hardly in place here to speak of the capabilities of the country agriculturally in any particular, but I will venture to mention the surpassingly ertile character of the soil met with throughout the journey to the head of he Soufriere Valley The soil of the *hills* is such as that usually found in he West Indian *valleys* Nor can I forbear mentioning the perfect adaptaility of a very large extent of country passed over for the cultivation of the invaluable Cinchona.

The low temperature astonished me The highest day temperature in the Souffriere Valley was only 65°, the lowest 56° Fahr On the road from "Landats" to the Cohabone Hills the temperature was only 68° Fahr at noon.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Published June 26th, 1876.]

SESSION 1875-6.

Seventh Meeting, 28th February, 1876.

Major-General Sir HENRY C. RAWLINSON, K.C.B., President, in the Chair.

Presentations.—*Samuel Horace Candler, Esq.*; *Robert Hamilton Few, Esq.*

Elections.—*Israel Abrahams, Esq.*; *Lieut.-Colonel Ackroyd*; *John Buckley, Esq.*; *Dr. W. Carr*, M.D.; *Colonel Edward Cave* (Madras Staff Corps); *J. L. Clifford, Esq.*; *Nav.-Lieut. James Edmund Coghlan*, R.N.; *Commander Alfred Eaton*, R.N.; *Alfred Ebden, Esq.*; *Samuel G. Gwynne, Esq.*; *Alfred T. Hawkins, Esq.*; *A. W. Hughes, Esq.*; *Captain Hon. George Napier*; *Thomas Routledge, Esq.*; *Joseph Johnson, Esq.*; *Murray Johnson, Esq.*; *Henry Jupe, Esq.*; *H. T. William May, Esq.*; *Major H. Thompson* (Bengal Staff Corps); *Lieut.-Colonel Adrian Deneys Vanrenen* (Bengal Staff Corps).

Donations to the Library from 14th to 28th February, 1876.—Archives de la Société Américaine de France, vol. i., 1875 (*Baron de Cosson*). Discoveries and Surveys in New Guinea, by J. Moresby, 1876 (*J. Murray, Esq.*). Versuch einer zusammenhangenden Darstellung des Stromsystems des obern Nil, von A. Steinwenter, Marburg, 1875 (*Author*). Statistical Register of Victoria for 1874, parts viii. and ix., and Reports of the Mining Surveyors and Registrars, 30th September, 1875 (*The Victorian Government*), and the current issue of publications of corresponding Societies, &c.

Donations to the Map-room from 14th to 28th February, 1876. —Diagram showing the depth of rain each day, and the total yearly rainfall in Adelaide from 1839 to 1874, Diagram showing the average monthly rainfall, and the maximum and minimum rainfall in each month in Adelaide, Melbourne, and Sydney, by the Hon Sir G S Kingston (*South Australian Institute, Adelaide*) MS map of Mr Elias' route between Bamo and Mung-Mau, 1875 (*Ney Elias, Esq.*) A map of the Country northward and westward of Candahar, by Lieut William Frazer Tytler, 1838–42 (*C R. Markham, Esq*)

The PRESIDENT informed the Meeting that according to information received from the Admiralty, the Commodore on the West African Station had despatched the gunboat *Sirius* from Ascension to Loanda on the 15th of January, with instructions to the Commander to hold himself at the disposal of Lieutenant Cameron, with a view to the conveyance of his men to the Cape of Good Hope It was very satisfactory, he observed, to find an officer of the Navy taking such a responsibility upon himself, in accordance with the general instructions which he had previously received from the Admiralty, the special instructions which were sent out on the application of the Council of the Royal Geographical Society not having reached the station when the gunboat was despatched to Loanda At the same time the *Sirius* would in all probability arrive too late to be of any real service, as it only left Ascension on the 15th of January, and would hardly be at Loanda before the end of the month, while Cameron expected to leave Africa for England at the latest by the middle of the month, in fact, when he last wrote on the 24th of December, he was only waiting for the completion of the repairs and provisioning of his vessel in order to send his men away at once, and to take his own departure immediately after.

The following Papers were read —

1 *A Visit to the Valley of the Shueli, in Western Yunnan (February 1875).* By NEY ELIAS, Gold Medallist, R G S.

[ABSTRACT]

MR. NEY ELIAS had been ordered to Bamo to prepare the means of transporting Colonel Browne's Mission across the Kakhyen country into China, and it became part of his duty to visit the Shueli Valley, in February and March 1875

Of the numerous routes leading from Bamo to Western Yunnan, two only are trade-routes, properly so called, namely, the Northern or Tapeng route, already reported on by Major Sladen and Dr. Anderson, and the lower or Sawuddy road It is upon the Sawuddy road that Mr. Elias now reports. The plain between the lower slopes of the hills from which this road descends and the Irawadi is from 9 to 10 miles broad, and the numerous streams spread themselves out in the form of swamps or shallow flood-lagoons, which are slowly dried up by evaporation. Thus it is only in the winter and early spring that a practicable road exists between Bamo and

Mansey, the point where it converges with the track from the Irawadi and enters the hills.

In ascending from Mansey the track leads, for a short distance, across the low land to the eastward, and then commences to mount the spurs of the hills—a rough mountain pathway leading along the side of a transverse range, which appears to be one of a series of three or four that abut, at one end, on the valley of the Irawadi, and at the other on that of the Shueli The views obtained of the Irawadi Valley and neighbouring mountains, from various points in the ascent, are extensive and beautiful The river itself, with its islands and sand-banks, can be clearly traced from its egress from the third defile to its entrance into the second The high land is inhabited throughout, and there are villages and patches of cultivation, but the road is merely a rough hill-side track, while many of the nullahs and rocky places try the endurance of loaded animals severely Nevertheless it is said to be easier than either the northern or middle routes

Besides the little gardens of tobacco and vegetables usually seen around Kakhyen villages, there are, in these hills, small enclosed patches of poppy, but the whole yield forms a very insignificant proportion of the amount of opium consumed, the balance being obtained from the Chinese Shan provinces of Yunnan. The greatest altitude is about 4700 feet, and shortly after attaining it a distant but magnificent view is opened out of the Shueli Valley, with the river winding through it, and beyond, the mountains of Yunnan This point can scarcely be called a pass, for the road winds obliquely over a rounded ridge of gentle gradients on both sides

The route emerges from the hills on the flat plain of the Shueli Valley, at the small Shan village of Canklem, on the right bank of the Nam Wun Here the Chinese border is crossed, and about a mile further on, standing like an island of trees and gardens in the otherwise bare plain, is the village of Kutlung, consisting of about thirty Shan houses

The distance from Kutlung to Mungmau is about 22 miles, and several moderate-sized villages are passed on or near the road, surrounded by some kind of light stockade, or low earthen wall. Mungmau is the capital of the Tsaubwaship, and may be regarded as the modern representative of the Mungmaorong of Major Pemberton, and the capital of the ancient Shan kingdom of Pong, founded A.D. 568. Mungmau stands on an open rising plain, at a distance of about a mile from the river's right bank, and is protected by a brick-wall, about 500 yards square and 16 feet high, with four gates. The buildings within the wall are inferior bamboo-huts, without arrangement of any kind, and the population is about 1800—all, except a few officials and soldiers, being local Shans

Nam-Kam, near the opposite bank of the river, and some 20 miles lower down, is the chief town of the Burmese Shan Tsaubwaship, forming one of the thirty-nine *maings* or townships of Theinnee. It is ruled by a Shan, there being no Burmese officials or soldiers.

The Shueli Valley, as a level plain, has its upper limit only some 6 or 8 miles above the town of Mungmau, and its lowest limit near the point where the river re-enters the hills, in its course to the south-west It would thus measure some 30 miles in length, with a breadth varying between 4 and 12 miles Nearly the whole extent appears to be good arable land, but less than one-half is under cultivation, rice and tobacco being the staple products Large fruit-gardens and fields of pine-apples are met with round the villages

From a physical point of view the most remarkable feature of this section of the course of the Shueli is its altitude above the sea, and the consequent great fall which the river must have in its course towards the Irawadi Taking the altitude near the lower end of the valley to be 2600 feet, and estimating that of its confluence with the Irawadi at 300 feet, we have a fall of 2300 feet to be accounted for, within a distance (allowing for windings) of 140 miles

Throughout its upper valley, in the Shan States, the Shueli flows in a wide but generally well-defined shingly bed, and with a scarcely perceptible slope between the upper and lower end of the valley. At the ferry within a mile of the Nam Kam the breadth of the river was about 100 yards, the average depth across some 4½ feet, and the surface-current about 1½ knot an hour

The scenery below the entrance of the river into the hills is remarkably wild, and I am informed that it continues to flow through almost uninhabited hill-tracts until it reaches the plain of the Irawadi. The Kakhyens describe the falls and rapids as occurring at intervals of every few miles, and a sheer waterfall, of great height, is spoken of, which is difficult of access owing to the rugged nature of the country around it

The Kakhyens, in this border region, are clearly the dominant race, and come and go in the Shan country as they please, attending the markets both as buyers and sellers, and frequently hiring the Shans as bullock-drivers or porters for their produce On the other hand, the Shans never venture among the hills of their neighbours without an escort of Kakhyens, procured through the head of a protected village. In bravery, courtesy, hospitality, and probably also honesty, the Kakhyens are far in advance of the Shans of the Shueli Valley.

In the Mungmau Tsaubwaship there are four localities where markets are held, and four also in Nam-Kam. Mr. Elias had opportunities of witnessing two of these markets, and in both cases there was a fair gathering of people, local Shans, and a considerable number of Kakhyens and Hill Chinese The objects for sale were chiefly eatables and chewing-stuffs, a little native cloth, and a few English piece-goods—such as red cambric, blue drills, T-cloth, and muslin, some salt, a few fruits, and salt fish. A great deal of the business is conducted by barter, and there is no coin current, all trade—not barter—being carried on by means of Chinese block silver. All the trade between Burma and the Tsaubwaship of Nam-Kam is carried on by the Sawuddy route, the animals used being bullocks or ponies.

After describing the Shueli valley, Mr. Elias has a note on the more northerly routes between the Irawadi and Yunnan. They are two in number, and though but little used at the present day, it is possible that in the earlier times one of them, at least, may have been a common highway between Yunnan and the Irawadi. It is certainly the shortest traverse from Momien to practicable navigation. The distance, by either route, is performed by ordinary travellers on foot in about six days, or, if on horseback, in five days, or even less. With our present information it is not possible to say whether either of these routes can be that on which Marco Polo describes the great descent of two and a half days' ride, leading to the forest of Mien, but one of them would certainly appear to point to the road travelled over by the 20,000 fugitives from Yunnan-fu to Ava in the year 1687, mentioned in vol. ii. p. 73, of Yule's 'Marco Polo.'

In a second note Mr. Elias gives some account of what is known of the origin or early history of the Kakhyen or Singpo race. The only two previous accounts are those of Major Hannay, who visited the Singpos in 1827, and Captain Neufville, whose explorations among tribes bordering on Upper Assam extended from 1825 to 1828 Both are necessarily brief, and both refer chiefly to the Singpos occupying the slopes of the Patkoi range, and the right side of the Irawadi valley. Comparatively little light is thrown on the more southern clans, sometimes known as the Kakoos, and whose homes are chiefly beyond the left bank of the river.

It is these latter mainly who are known to the Burmese, and who have been named by them Kakhyens. In all probability they are looked upon as an inferior race by their brethren to the north—the Singpos proper—but still they are in no way subject to the latter, while their language, customs, and traditions, are essentially the same.

The Kakhyens are subdivided into numerous clans or sub-tribes, and are also sometimes roughly spoken of as Kakoo-Kanams, or upper and lower Kakhyens, referring to the positions they respectively occupy as regards the Irawadi The dividing line is generally indicated as the third defile of the Irawadi But most of the Kakhyen clans change their positions considerably in the course of a generation or two, the tendency being to press towards the south.

All the lower Kakhyens point to the north as their original habitat, and it is reported that, at the time of the present King of Burma's accession to the throne, no Kakhyens existed within the government of Momien, whilst at the present day large numbers are to be found there, and at other places south of the second defile of the Irawadi.

As far as Mr Elias has been able to ascertain, no mention of Kakhyens or Singpos is to be found in Burmese writings until very recent times, and perhaps the earliest mention of them in any written language may be that contained in the Shan histories of Mogaung

The country at present occupied by the Singpos, and the more northern of the Kakoo tribes, would seem formerly to have been inhabited by the Noras, a tribe of Shan kinship. In about the year 1225, the kings of Mungmau undertook the conquest of the Noras, as part of his scheme for the subjection of Upper Assam, and it is in the records of this campaign that the Kakhyens are first mentioned; and both the date and locality of this first appearance of the Kakhyens coincide with their own traditions

Mr Elias obtained a copy of a pedigree, which was put in writing, at Bamo, under instructions from one of the most powerful chiefs among the Kakoos or southern Kakhyens. He refers the birthplace of his race to the east of the Irawadi, and on the southern border of Khamti, and places the first man at a distance of twenty-three generations from the present time. As a subject connected with their history, Mr Elias gives a list of the *Nats*, or spirits, worshipped by the Kakhyens If viewed in the point of a connecting link with their Hindu neighbours in Assam, it will be seen, too, some slight impression has been made by contact with the latter, and a few, at least, of their *Nats* may be traced, either directly, or through the Shans or Burmese, to Hindu mythology. Further investigation of their traditions might bring to light still closer connection Probably their religion is made up of a mixture of all the various idolatries and superstitions of the nations with whom they have intercourse

During the short time spent in contact with the Kakhyens, Mr. Elias was frequently struck with points of resemblance between them and the "Gold-teeth," the "Zardandan" of Marco Polo, and the "Kinchi" of the Chinese writers, although the locality in which they are found, and the absence of the characteristic custom of covering the teeth with gold, prevent the Kakhyen or Singpo tribe from being identified with the "Gold-teeth" The Kakhyens change their position very considerably in course of time. Still they have no tradition of having come from so far east as beyond the Salween, where the "Gold-teeth" appear to have lived Marco Polo says that the "Gold-teeth" tattooed their arms and legs The Kakhyens resemble them to some extent in this custom, although tattooing is not universal with them The custom of "couvade" does not exist among the Kakhyens, neither "Gold-teeth" nor Kakhyens have prejudices regarding food, and both make a drink of rice-wine Neither have idols or churches, letters, or writings Both have the custom of cutting notices on a piece of stick and then splitting it, so that one half may be retained by each of the two parties to a transaction Both had "never a leech," and appealed to the devil conjurors On the whole, although there are points of resemblance, it is probable that we must look further east for descendants of the "Gold-teeth" The tribe most probably representing the "Gold-teeth" is that of the Leesaws in Western Yunnan, who nearly resemble the Kakhyens in features, costume, and arms

Mr Elias concludes his paper with a note on the route survey from which he constructed the map His original paper will be published entire in 'Journal,' vol xlvi

Colonel YULE, before discussing the subject of the Paper just read, begged to remind the Meeting of the past services rendered by Mr Ney Elias to Geography The journey he took a few years ago through Mongolia from Peking was one of the most extraordinary that had ever been performed by a single traveller Issuing from the gate in the Chinese Wall to the north-west of Peking, he entered the Mongolian desert and traversed it for 2000 miles, accompanied only by one Chinese servant and a camel driver, till he came out at the Russian frontier in the Altai From the correspondence he had had with him he was convinced that he was a man capable of earning still greater distinction as a traveller. He was an excellent and accurate observer, and gave capital accounts of what he saw There was also a strong sense of humour in his letters The Shueli Valley had been a little remarkable in the history of the geography of Eastern Asia during the last half century, and the Paper reminded him of the great controversy that raged about forty years ago about the sources of the Irawadi, and the supposed connection of that river with the Tsampu, or upper course of the Brahmaputra. The idea of that connection had been started on several occasions at intervals by very eminent geographers, the great D'Anville being the first. The same notion was taken up by Alexander Dalrymple at the end of last century, and lastly by Klaproth, a celebrated German, who had the most extraordinary faculty both in languages and geography, but who unfortunately furnished a proof that a man might be a very great geographer and linguist and a good deal of a knave People heard with horror the other day of the man at Bremerhaven who wished to hide a box in a ship so as to blow it up in the middle of the Atlantic, thinking he would be safe before the explosion took place In a similar way, but with manuscript documents of fictitious geography, instead of explosive materials, Klaproth planted two boxes, one in the English Foreign Office, and the other in the Russian War Department, and they did not explode until he was in his grave, having first pocketed, in payment of his fabricated information, 1000*l* from the English Foreign Office, and how many pounds from the Russian War Department the next generation perhaps would know It was one of his theories that the Tsanpu came down and formed the Irawadi. He produced Chinese documents to corroborate it But everything written in Chinese was not to be taken as true, the Chinese speculated about geography as well as Europeans, and finding the Tsanpu flowing through Thibet and disappearing they knew not whither, and the Irawadi running out in the south to Burmah, coming they did not know whence, they "combined the information," and concluded that probably the Tsanpu was the Irawadi Klaproth wrote a good deal on the subject, brought a great deal of argument to bear upon it, and distorted for his purpose an enormous amount of latitude and longitude His view was taken up by almost all Continental geographers, and maps were published in accordance with it, some representing the Tsanpu as running into the river of Bhamo, and others as into the Shueli At last, in about 1836, Colonel Hannay of the Bengal army, who was the first European traveller up the Irawadi Valley, saw that the river at Bhamo was but a small stream, and certainly was not capable of holding the waters of the Tsanpu, in spite of Klaproth's argument In a very beautiful map by Berghaus, the Shueli was represented as coming down all the way from Thibet, but it was now known that it did not run any great distance. Still some curious questions remained with regard to the rivers flowing southward from Thibet, especially the eastern branch of the Irawadi The maps of Thibet by employés of the Jesuits, such as were now called Pundits, represented a certain number of rivers flowing from the great plateau towards the south and then lost to sight Then there were the maps of Yun-nan by the Jesuits themselves, which showed great rivers emerging from the north and running down to the Indian Ocean, and the difficulty was to adjust them all No reasonable person now doubted that the Tsanpu was the Brahmaputra which flowed into the Bay of Bengal Then on the other side there was the Mekong, which also undoubtedly came from Thibet, and the Lu-Kiang or Salween, flowing into the sea at Martaban, and certainly coming from the same country There was next a river difficult to identify, called in some maps the Khiu-shi, or Kuts' Kiang,* and he had very little doubt, for a reason he was about to mention, that this must be the eastern source of the Irawadi The next river to the westward of the Ku-Kiang, and the only one lying between that and the great Tsanpu (which comes down into Assam under the name of the Dihong), was called in the Chinese maps the Kan-pu When he (Colonel Yule) was in Calcutta fifteen years ago, a letter was received from the Vicar-Apostolic of the Roman Catholic Missions at Bonga, in Eastern Thibet, giving an account of the rivers east and west of him Part of the account was very much perverted by his having one of the maps founded upon Klaproth's ideas, and he thought he was giving the geography he had picked up in the place, whilst he was really stating the false geography he had learned from Klaproth's map, but he mentioned that on this river, the Kan-pu, had occurred the murder of two French priests, Messrs Krick and Boury, who had been trying to penetrate from Upper Assam into Thibet about 1842 or 1843. Now it was known, from information on the Assam side, that that murder took place upon the Lohit River, the eastern branch of the Brahmaputra There could therefore, he thought, be no doubt that the Kan-pu of the Chinese was the eastern branch of the Brahmaputra, and that that river ought to have a much longer source given to it than was usually the case in modern maps The only Thibetan river thus remaining unaccounted for was the Khiu-shi or Tchitom-chu, which he believed would be proved to be the eastern source of the Irawadi And this belief is confirmed in some degree by the fact that Dr Anderson mentions that the eastern branch of the Irawadi is called by the Khamti Shans "Kew-hom"

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* Called in D'Anville's map the Tchitom-chu

2 *Afghan Geography*. By C R MARKHAM, C B., F R S., Secretary R G S

THERE can be no greater misconception than to suppose that the work of discovery and explanation is well-nigh complete The *terræ reclusæ*, for the searching out of which our Society was founded, are still widely scattered and of vast extent The good work which is now progressing in the Topographical Department of the War Office, and the materials which have recently been brought together in the India Office, remind us that Afghanistan, or a great part of it, in spite of the occupation more than thirty years ago, and of previous and subsequent travels, is still one of these *terræ reclusæ* Politically and commercially, Afghanistan, lying between India and the line of Russian advance, contains the most important highways in the continent of Asia, yet vast tracts within its limits have never been explored. Some information, long neglected or forgotten, has recently been collected, and seems of sufficient interest to be worthy of being brought to the notice of a meeting of our Society, as it increases our knowledge of the geography of Afghanistan in some degree, and enables the inquirer to obtain a more accurate idea of portions of one of the great mountain bulwarks of our Indian Empire The new information is contained partly in route-surveys not hitherto utilised, but chiefly in extracts from the manuscript journal of General Lynch, which have been communicated by his brother, our associate, T. K. Lynch, Esq They relate to a visit which he paid to the upper part of the valley of the Argandab.

The great opportunity for acquiring a correct knowledge of the geography of Afghanistan was during the occupation of the country by British troops A reference to the twelfth volume of our 'Transactions' will show that, in 1840, our President, Sir Henry Rawlinson, wrote from Kandahar that "the accumulation of materials of positive geography was going on steadily and satisfactorily," and he adds, "I trust that the Indian Government will not delay much longer to display their treasures to the world"

Unfortunately Sir Henry himself then had other work to do, and many of these treasures were lost or forgotten Officers in the field worked well and zealously, some of them under Sir Henry's own instructions, and much material was collected. But there, to a great extent, the matter ended There was no one man, no department, diligently to bring all the material together, and to see that it was made use of A portion of the work of the officers in the Afghan war was embodied in Mr Walker's second edition of his map, but a great deal has never yet been fully utilised, and it is to this hitherto neglected material that I now propose to refer

Afghanistan is divided into two regions, eastern and western, watered respectively by the River Kabul and Helmund, and in both our geographical knowledge is incomplete There are scarcely any data for the valley of the Kabul River above Jalalabad, though it is true that the river, from the Kabul plain to Jalalabad, runs through a series of gorges quite impassable to travellers, so that there is no road near the banks on either side Neither are there data for the two chief constituents, namely, for the River Kabul itself, from the confluence to within a few miles of the city, and for the larger river from the north, composed of the Ghorbund and Panjshir streams, from the confluence up to near the base of the Hindu Kush Still more important, the great valley of Ghorbund is practically a blank, though the passes leading from it across the mountains are described in some detail by Leech and Garbett There is a great deal of information regarding Kohistan of Kabul in the published reports of Leech, Pottinger, Masson, Houghton, and others, but much remains to be done, and a considerable area is still a blank Some of this blank area was probably surveyed by Captain Sturt, the gallant hero who served through the war, and perished in the Kurd Kabul Pass, but if so, his work has been lost.

In the Helmund valley, the work of the military surveyors and explorers has, however, for the most part been preserved, but it was long forgotten, and has remained unused The most interesting single exploration was that undertaken by General Lynch At the time he sent in to Government, through our President, who was then Political Agent at Kandahar, a full and very interesting report on the Jaguri Hazarehs, from which considerable extracts have recently been printed in Colonel MacGregor's 'Gazetteer.'*

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* Central Asia. Part II p 323

The 'Journal,' however, contains many details not given in the Report.

General Lynch set out in September, 1841, from a station near the head-waters of the Turnuk, and visited the valley of the Argandab Both these rivers are naturally tributaries of the Helmund, but their waters are exhausted by irrigation before they reach the main stream The upper courses of the Helmund and Argandab * are in the mountainous country of the Jagúri Hazárahs, which is almost entirely unknown, yet a knowledge of this region is of great political importance. It was occupied in ancient times by a people of Tajik race, whose chiefs fortified themselves in the almost inaccessible mountain-recesses, and long resisted the invasions from the direction of Persia or Ghazni. The most important chiefship was that of the Shansabaniah dynasty of Ghur, whose head, in the twelfth century, conquered Ghazni, and eventually overran Hindustan, and established his rule at Delhi But the Tajiks appear to have been conquered, and their country overrun by the Mughal conquerors, who established four regiments of Turks, of a thousand men, in this mountainous region Hence the name *Hazárah* (or a thousand) for the people, and *Hazárah-jat* for the country, which is the plural of *Hazárah*. In the same way the district of the Derahs, on the Indus, is called *Derahjat* The *Hazárah* were composed of four Turk tribes, called *Char-i-mak*, and the present inhabitants of this region are their descendants The fullest account of the early Ghuri dynasty is in the *Tabakat-i-Nasiri*, now being translated by Major Raverty The country, though lofty and snow-covered in winter, is probably quite practicable for the march of armies, and for caravans of commerce, and its mountain-recesses contain much that is interesting and valuable

Two very important documents for the geography of the Hazárah country are Captain Arthur Conolly's route from Kabul to Mymeneh, published in the 'Calcutta Review' for 1845, and Eldred Pottinger's Report on the country between Kabul and Herat, which is printed in Colonel MacGregor's 'Gazetteer' † Ferrier also crossed one corner of the Hazárah country

But, with the exceptions of Conolly, Pottinger, and Ferrier, General Lynch is the only European who has penetrated into this secluded region In September, 1841, he left the valley of the Turnuk, and entered a gorge of the mountains leading to the basin of the Resenna, through which flows one of the Turnuk feeders.

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* The length of the course of the Argandab is about 350 miles, the source being about 8500 feet above the sea, and the mouth in the Helmund, 2000 feet

† Central Asia Part II p 811

This Resenna basin is described by him as about 7½ miles long by 5, and surrounded by high mountains. The valley is highly cultivated, yielding fine crops of corn and lucerne, and is irrigated by *kharız*, or underground watercourses. It was densely populated by people of the Hazárah race, and covered with forts, in which they reside for safety The Hazárahs and Afghans are at deadly feud, holding the tenets of the two antagonistic Muhammadan sects. The Hazárahs, as a rule, may be distinguished from the Afghans by dearth of hair on their faces, and rather snub noses

Continuing to march across the country, between the Turnuk and the Argandab, General Lynch descended through a gorge into another basin called Naran by the inhabitants, and Angori by the Afghans He describes the basins or valleys of Resenna and Angori as perfect little paradises, surrounded by barriers of rocky mountains, from which numerous streams descend In the Angori valley there were no less than 150 forts, in which all the inhabitants live, and into which they drive their cattle in times of danger The population is about 5000 The Sultan, or Chief of this secluded valley, and his son, received their guest most hospitably, and showed him some excellent sport.

Thence the route led, by Margari, down the stream of Loman, to the banks of the Argandab, which is here a fine river, flowing rapidly over a ford where the water was up to the horses' girths General Lynch was lodged in the fort of Kuleh Jaffer Sultan, close to the river, which was rushing over huge granite boulders with a deafening noise. The valley was populous and well cultivated, and, as a consequence, there were numerous forts It is called in this part Seng-i-Marsha

In the valley of the Argandab there are many carvings on the rocks From the rough copies which General Lynch showed him at Kandahar in 1841, Sir Henry Rawlinson judged that these were not real inscriptions, but rude marks and symbols cut by the mountaineers, possibly, however, of an ancient date Near Seng-i-Marsha, at a place called Seby Chúb (or the green wood), there are inscriptions on a large block of dark-coloured granite As they are on the road leading from Malistan (the district at the sources of the Argandab) into Uzeristan,* General Lynch suggests that they may have been inscribed for the purpose of denoting the hours, or the distance in hours from a large city that once existed in Malistan, the ruins of which may still be seen. He heard of rock-inscriptions in other parts of the valley, and of ruins, including old towers built at intervals on a road The interior region, now called Hazárah-jat, once the seat of the Shansabaniah Dynasty of Ghur, is no doubt full of such ruins It was many centuries before the inhabitants of the country, who preceded the present Hazárahs, were all converted to Islam, and they resisted invasion by constructing numerous *kushk* or fortified villages In the *Tabakat-i-Nasari*, now being translated by Major Raverty, there is a frequent mention of the building of forts and towers by the Ghuri kings.

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* Most of the places mentioned by Lynch are named in extracts from Burnes and Leech, given in MacGregor's 'Gazetteer of Afghanistan,' p 322

Leaving the Argandab, the explorer entered a narrow valley to the south, which brought him to a place called Girdí, where his tent was pitched in a grove of trees near the remarkable mountain-peak of Ser-i-Saduk The tribe inhabiting Girdee are called *Khodadad*, or " God given " Here he found a number of curiously-shaped pyramidal mounds or *tupas*, in many of which there were cells or excavations occupied by Hazárah families In all directions there were old silver and lead mines, and General Lynch has little doubt, from the information he received, that coal is to be found in some part of the Hazárah country On many of the rocks there were inscriptions and hieroglyphics.

In this valley there was a plentiful growth of the *Salab (Salep)-i-Misri*, which is like an onion The bulbous root, when dried in the sun, shrinks into a small hard substance, which is the *Salab* (*Salep*) so much used in India for strengthening invalids Its name here is *Peaj-i koh*, or " the onion of the mountain " *

From this point General Lynch commenced his return journey to the valley of the Turnuk, through a well-cultivated but mountainous country, thickly dotted with forts The road led thence into the fertile vale of Dolena, where he encamped near a clump of trees and close to a stream of delicious water The mountains, 4 miles to the north, throw out spurs, forming a beautiful crescent, and half enclosing a fertile tract Following up a ravine to the south-west, there are several rock-cut figures and inscriptions Here also is a large cave, the entrance of which is small, and partly filled up to keep the sheep out, but inside there are halls about 30 feet high, and galleries cut through the rock in various directions Its extent is unknown to the present inhabitants of the neighbourhood, but it leads far into the bowels of the earth Near it is a high mountain, called Mérzuka, on the summit of which is a fine table-land, once the site of a town where, say the natives, the King of the Gins resided and held his court

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* It is not, however, an onion, but a *Eulophia* (belonging to the *Orchidaceæ*) Dr Cleghorn says that the starch is highly nutritious, and the tubers fetch a high price It is carried all over India, as far south as Bangalore, by the Kabul horse-dealers, and is eaten, boiled with milk, like arrow-root, for dysentery and internal inflammation Mr Baden Powell has given a full account of *salep* in his 'Handbook of the Economic Products of the Punjab'

General Lynch also made an excursion to a place called Zer Keshan, in a defile of the mountains. On either side of the track he observed large blocks of granite, in which were circular holes cut or ground out, about 3 feet in diameter and 18 inches deep, in the centres of which were small holes still deeper. He was told that the gold, found in a mine close by, was ground in these holes, and the general aspect of the place indicated that works on a large scale had once been carried on there. From the summit of the Zer Keshan mountain a magnificent view was obtained, and a round of angles taken

Another object of interest was the shrine of Bíbí Nani (Nannea or Diana), in a cave on the top of a gigantic scarped rock, about 200 feet high, which overhangs a cluster of forts, while from the base of the rock flows a copious clear stream, the source of the Turnuk The cave is entered by a number of small doorways cut in the rock, and inside there is a cairn or mound of stones, by the side of which the women sacrifice to Bíbí Khani In climbing the scarp they often fall, and, if not mortally wounded, are seriously hurt On reaching the cave they erect, between two sticks, a cradle in which they put a doll-like bundle, and pray to the goddess for the objects of their desires From the rock there is a glorious view far away over the lake of Abastadeh, and the valley of the Turnuk

The worship of Nani or Nannæa, the Babylonian Venus, was introduced into Bactria from Syria, and is frequently indicated on the Indo-Scythic coins The name of Bíbí Nani still appertains to many sites in Afghanistan, but, of course, no religious rites or worship are now performed at the shrines

The sources of the Turuk are at the base of a high rock on the high road from Kandahar to Kabul, and to the north of the village of Mudur, where there is a pool of water supplied by six or seven springs. Dr. Kennedy also visited the source, having followed the course of the river for 150 miles from Kandahar. The Turuk would naturally join the Argandab about 40 miles below Kandahar, but, in fact, the Turuk water rarely, if ever, now reaches the Argandab, both of these rivers being consumed in irrigation a short distance to the south-west of Kandahar

After making the proper arrangements for the peace of the country during his absence, General Lynch proceeded to Kandahar in the end of September, 1841, to pass the winter, and took up his quarters with our President, Sir Henry Rawlinson.

Although General Lynch did not prepare a map, he has regularly recorded bearings and distances, with rounds of angles at several conspicuous points, so that the new region which he traversed, with the positions of places and courses of rivers, can be added to the map of Afghanistan

To appreciate the value of this journal, a clear idea should be formed of the unknown region, a small portion of which is described in it. The upper basins of the Helmund and its tributaries descend from the Safid-Koh, the Paropamisus of the ancients, a series of lofty and rugged mountains, cut by deep ravines, and inhabited by the Hazárah tribes To the south and east is the road from Kandahar to Kabul, to the south and west that from Kandahar to Herat, and to the north Eldred Pottinger's route from Herat to Kabul The vast region between has never yet been thoroughly explored for a length of 300 miles It forms a triangle with Kandahar at the southern angle

General Lynch just penetrated a short way into it from the south, and surely what he tells us is calculated to whet our curiosity We hear of a simple and hospitable people, of lovely valleys, well watered and highly cultivated, and surrounded by magnificent ranges of mountains, of vast natural caverns, of mines of silver, lead, gold, and coal, of curious rock-inscriptions and sculptures, and of ancient ruined cities

General Lynch was not, however, the only officer who explored the previously unknown country round Kandahar

Colonel Fraser Tytler, of Balnain and Aldourie, was in Afghanistan, in the Quartermaster-General's department, from December, 1838, to December, 1842, and devoted the whole of his spare time to the collection of geographical materials To his care is also due the preservation of the route-surveys of several other officers. Of these the district of Nesh, between the Helmund and Argandab, the district of Teereen, and the country on the right bank of the Argandab to the east of Nesh, were surveyed by the engineer officers, Captain Sanders and Lieutenant North, accompanied by a force sent by General Nott to restore order in this part of the country in 1841. The valley of the River Bugran, a tributary of the Helmund, which rises in the Siah-koh and joins the main stream a few miles above Girishk, was surveyed by Lieutenant Cooper, of the Bengal Horse Artillery. The valley of the Helmund, from the junction of the Argandab to Rudbor, including the whole country of the Garmsil, was explored and roughly surveyed by Lieutenant Patterson, who was despatched on a mission in this direction by Sir Henry Rawlinson. Patterson was soon afterwards murdered by some mutinous troops at Kandahar. A detailed survey of the valley of Kandahar, and a plan of the city, were executed by Mr. Fraser Tytler.

All this material was preserved by Mr. Tytler, who recently presented it to the Geographical Department of the India Office, and the several sketch-routes have been joined up on one scale, and lithographed on a single sheet.

In 1845, with the rich materials that he had so carefully collected, Mr. Fraser Tytler commenced the compilation of a general map, and completed it during the following two years. It covers the ground from the mouths of the Indus to Bokhara, and from the Sistan Lake to the longitude of Delhi, and, with the original surveys, is the most important geographical work connected with the Afghan war. This is the only map on which there is any attempt to treat the Hazárah country intelligibly, and it is the only one which combines all the materials then attainable. Colonel Tytler has presented it to the Geographical Department of the India Office, and it is exhibited here to-night in order that the value and originality of this admirable compilation may be appreciated.

In conclusion, I must add that the unearthing of these precious materials for a new map of Afghanistan is due to a hint from our President, Sir Henry Rawlinson, which turned the quest on the right scent. In this way were brought to light the route-surveys of Sanders, North, Cooper, and Patterson, the large general map of Tytler, and the interesting narrative of Lynch. All have been, or will be, handed over to our associate, Major Wilson, of the Topographical Department of the War Office, who is engaged in the preparation of what has long been a desideratum in geography, namely, a map of Afghanistan based upon all existing materials.

It will then be seen how wide are the gaps that require to be filled up, and how much there is for the daring traveller to explore before Afghanistan can be completely mapped. From a political, as well as from a commercial, point of view, this region is of vast importance; and one useful step towards its exploration will undoubtedly be the thorough taking stock and utilising of all existing materials.

Colonel MACGREGOR made the following remarks:—

The subject of Afghan Geography is one which should have been of the very greatest interest to us. I say, should have been, advisedly, because it is a fact that although our frontier has run with Afghanistan for the last thirty years, though our attention as an Asiatic power has been drawn to it since the commencement of this century, and though we must always have felt the day might come when we might again be drawn into closer connection with it, still for more than thirty years we have almost neglected all attempts to add to our knowledge of that country. This want of information has been more brought home to me than to most people, and therefore it is right I should continue, as I have done hitherto, to take every opportunity to bring it to notice. In 1869 I was employed by the Indian Government to compile a work from existing records, relating to the topography of Afghanistan. I did so; yet, though it was finished in 1871, nearly all the information in it dates from as far back as 1841–2, having been, in fact, collected by the gallant officers of our army operating in the country in those years, and therefore it is evident that it might just as well, in fact better, have been done in 1849 than in 1869.

Having thus acquired some knowledge of Afghan Geography, I might tell you here much that no doubt would be new to many of you; and the best thing I could do would be undoubtedly to extract from those pages of my work which relate to the subject of this evening; but, in the first place, the time at my disposal is limited, and, in the second place, my work has been made of such a strictly confidential character that I am not sure that I should be justified in reading it myself without permission. But if I may not tell you what is in it, I may at least say what is not in it; and if the list seems to you rather a long one, my mentioning it here may perhaps have some effect towards inducing those, in whose power it lies, to do a little towards diminishing it.

I will begin with the parts of Afghanistan nearest our frontier; and it is strange to find that, if we except a few places where our troops have penetrated in the various frontier expeditions, we are just as curiously ignorant of the country immediately beyond our border as we are of many other important parts of Afghanistan. We do not even know the proper course of the Indus between Boonjee and Takkot, and of the Dard valleys which drain into it on either side between these points, namely, Chilass, Kolee, Paloos, Darel, &c., we know not much more than the name. Then of Yaseen, Kungoot, Hunza, Nager, and other tributary valleys of the Gilgit River, we do not know a quarter enough, and the same may be said of Wakhan and Badakhshan, and of the whole of the Chitral and Kashkar valleys.

Coming further south, our knowledge of the hill country of the Yoosufzaiclan, viz., Chakesai, Ghorbund, Booner, Swat, Deer, of Bujawur, and the further Mohmund country is extremely limited.

I might continue this list all down the frontier till we come to Sind, and show that the country of the Afreedies, of the Zwaemoosht, Bungush and Toorees, of Khust and Dawar, the Zhob valley, and the large tract inhabited by the Kakurrs, are almost to us sealed books. And to show that I am not exaggerating, I may mention that I have three times fruitlessly given in lists of no less than seventeen important military routes, leading from Afghanistan to our frontier, of which we have not sufficient information to enable our Government to form any sound opinion. There is one point which will bring this before you in a very clear light. You have all read Sir H. Rawlinson's able work, in which he says that if the Russians go to Merv we must go to Herat. Now I ask by what route would such a force enter Afghanistan? Probably you will answer by the Bolan. But why the Bolan? our principal military strength is not down in Sind, but in the Punjab, and men as well as materiel could much easier be concentrated at Mooltan than at Sukkur. Still I think the route chosen would be the Bolan, and the reason is because we do not know any other sufficiently well. And yet, in the list I have alluded to, there are no less than six other routes mentioned which are probably not inferior in any one respect to the Bolan.

Then, though in our most recent and best map of Central Asia by Colonel Walker, the hills and rivers of the country north of Kandahar and east of

Herat are very boldly and graphically delineated, the fact is, we have almost no warrant for placing anything here but a blank. And this is a country which is of the utmost importance to us, for through it lead important military routes from Maimunna to Kabul, from Bala Moorghaub to Kabul, two routes from Herat to Kabul, one by Bamian and the other by Besood, a route from Herat to Ghuznee, and a direct route from Kabul to Furrah

Besides all these unknown routes, I find there are a series of passes, no less than thirteen in number, which lead over the Hindu Kush from Balkh and Kunduz to Kabul, regarding the military practicability of which we are absolutely ignorant Finally, we know far too little of the country lying in the direct line between Kelat and Seistan

It may be said it is all very fine to pick holes, but I beg to say I have done more than this, for I have shown how all this may be remedied, and till it is remedied we cannot be said to know Afghanistan thoroughly, nor can our Government ever feel free to undertake operations in that country

The policy, too, of thus exposing our ignorance may be doubted. But it is not I who expose it the blanks on our maps of that country have shown it only too clearly for the last thirty years, and, besides, I think it is much better to acknowledge our own ignorance than to ignore it till it brings us to grief The first step towards rectifying a fault is to acknowledge it, and as we have now done the last, let us hope ere long the first may meet with the attention it deserves

Colonel YULE said that the defects or discrepancies in the maps of Afghanistan were so great, that in trying to establish the distance between Kabul and Charikar, a celebrated post near the foot of the Hindu Kush, he found by measurement that on one map it was 42 miles, on another 27 miles, and on a third 34 miles What had become of all that was done during the Afghan campaigns? He had been making inquiries for a long time about Major Saunders's maps, and those of Lieutenant Sturt, but they seemed to have been utterly lost, and nobody could tell him anything about them He had written to various offices in India and inquired at the India Office, but could discover nothing of them. The only trace of Sturt's maps was in a little rather trifling book,* called 'A Peep into Turkistan,' the author of which accompanied Lieutenant Sturt in a journey that he made from Kabul to Tashkurgan shortly before the outbreak Sturt appeared to have lent this writer his map of the route, and a meagre lithograph derived from it was the only trace that could now be found of the labours of Lieutenant Sturt for a year and a half

Mr TRELAWNEY SAUNDERS said there were no doubt many gaps to be filled up in the geography of Afghanistan, but much better use might be made of what was at present known than in the wall-map exhibited at the Meeting, which gave quite an erroneous view of the orography of the region.

The PRESIDENT said the map referred to by Mr Saunders was merely a rough diagram which did not pretend to the accuracy of a scientific document. There was no doubt a great deal of truth in the complaints that had been made about the insufficiency of our present knowledge of Afghan Geography, but it should be remembered that when the British army occupied Afghanistan, the several departments of the force had more important matters to think of than collecting geographical information There was no regular survey department attached to the army, and the political department, which might have supplied its place, was overwhelmed with other work, so that surveying operations were put off till a more convenient time. That time, however, had never come. Colonel MacGregor had omitted also to point out how the desiderata might have been obtained since the date of the occupation. Afghanistan had been a sealed book during the greater part of the interval, for many years it was entirely isolated, and it was at the risk of their lives that travellers like Colonel Pelly, and one or two others, occasionally passed through the country

The region, indeed, bounded on the south by the Kabul River, on the east by Kashmeer, and on the north by the Hindu Kush, was about as difficult to examine and travel in as any portion of Asia Of late years efforts had been made by the Survey Department in India to obtain some information regarding it by means of native explorers, and certainly the Government in India was fully aware of the necessity of pressing their inquiries in that direction as far as they reasonably could, but he could not hold out the prospect of the country being thoroughly surveyed under present circumstances Small additions, however, were being constantly made Colonel MacGregor was probably not aware that within the last two months Captain Sandiman, with an escort, and a large party of Belooch chiefs, had marched from the Valley of the Indus in the direction of Quetta to Sibi, and, without entering the Bolan Pass, had proceeded by an easy route from Sibí to the head of that Pass, called Bibí-Náni, from whence the party might, in 10 miles, have debouched on the high table-land of Shawl or Quetta Whenever an opportunity offered, the authorities were quite alive to the necessity of obtaining information, but it must be a work of time With regard to the Hazárahs, whom Major Lynch visited, they were a very remarkable race, speaking an old Persian dialect, and yet having all the physical characteristics of Kalmuck or Tartar descent He was not aware on what authority Mr Markham had said that the Tajiks inhabited those mountains before the time of the Ghaznevides

Mr MARKHAM Major Raverty

The PRESIDENT doubted the fact There certainly was a chief, the Shár of Gharshistán, who might have been a Tájik or Arian, but the original inhabitants of the country in historical times were the Yue-chi or Sacæ, a Scythian race, who occupied the district in the first century before Christ, and he believed to them was attributable the present Kalmuck or Tartar type of countenance. He also thought these Yue-chi or Sacæ made the caves and sculptures which were seen by General Lynch They were Buddhists, and made caves for ascetic retirement, wherever they settled, and he considered the caves found in the valley of the Argandab and Helmund dated from the time of the Yue-chi occupation He also thought General Lynch was in error in speaking of inscriptions, for he remembered perfectly well seeing the copies which the General brought back from the mountains nearly thirty-five years ago, and being satisfied at the time that they were merely rough carvings and tracings which the wild tribes had made on the rocks in memory of their visit to the spot. They were mostly shepherds, and the figures were rude imitations of sheep, horses, goats, cattle, &c, without any attempt at alphabetical writing He had that day, in looking over his papers, lighted on some memoranda which he had collected at Kandahar in 1840, giving several cross-routes from the valley of the Turnak to the valley of the Oxus, one from Kandahar, straight across the mountains to Maimana, and another from Kelat-i-Ghilzye to Balkh, but as the notes were merely collected from native travellers, of course they were not reliable geographical data He believed that many officers who were in Afghanistan at that time collected such information as they could, and if the information thus obtained could be now put together and utilised, the map might be still further filled up At present it was certainly not satisfactory that a country which had been occupied by the English for three years should be so imperfectly represented geographically Whenever the Russians occupied a new country, the first thing they did was to examine it thoroughly with a view to constructing a map, while England left geography to take care of itself, or to be dealt with at some other time He regretted that there had not been more discussion on Mr Ney Elias' paper, as the author had bestowed very great pains upon the report, and was a most intelligent and deserving officer. He was now officiating as the British agent at Bhamo, and might have an opportunity of distinguishing himself very shortly, as that region would in all probability become the theatre of interesting events, when Mr Grosvenor's Mission reached the frontier, and the escort sent from Rangoon marched up from Mandalay Mr Markham had mentioned several travellers who had passed through the Hazarah Mountains, but he had omitted Mr Stirling, of the Bengal Civil Service, who crossed them about 1827, and who, he believed, was still living. Mr Stirling published a report of his journey at the time, which was to be found at the India Office, and in many private libraries

Eighth Meeting, 13th March, 1876

SIR RUTHERFORD ALCOCK, K C B, VICE-PRESIDENT, in the Chair

PRESENTATION —*Charles James Wainwright, Esq*

ELECTIONS —*R Arrowsmith, Esq* (Government Inspector of Mines and Mining Surveyor), *James Biggs, Esq* , R N , *Major-General James Black* , *George C Boor, Esq* , *Alfred Heneage Cocks, Esq* , *James Coles, Esq* , *The Hon George Denman* (Judge of the Common Pleas) *Major William K Elles* (38th Regiment), *The Hon Charles Herbert Stewart Erskine* , *Major Oswald Barton Feilden* (78th Highlanders); *Louis Floersheim, Esq* , *Edward L Hall, Esq* , *Frank Charles Jarvis, Esq* , *Richard Petch, Esq* , *Henry Rae, Esq* , *John Williams, Esq* , *Thomas Boorman Winser, Esq* , *Major Herbert Wood,* R E

DONATIONS TO THE LIBRARY, FROM 28TH FEBRUARY TO 13TH MARCH, 1876 —Bulletin of the U S Geological and Geographical Survey of the Territories, 2nd ser , No VI (*Dr F V Hayden*) Nuova Italia, vol ii , by Dr J McCosh, 1875 (*Author*) Port Catalogues of the Chinese Custom's Collection at the Austro Hungarian Universal Exhibition, Vienna, 1873 , Trade Statistics of the Treaty ports in China, 1863—1872 , Reports on trade at the Treaty ports, 1871–1873 , Statistics of Trade at the Ports of Newchang, Tientsin, Chefoo, Hankow, Kiukiang, Chinkiang, Shanghai, Ningpo, Foochow, Tomsui, Takow, Amoy, Swatow, and Canton, 1863–72 (*The Inspector-General of Customs, Peking*) Demarcacion politica del Peru, Lima, 1874 (*The President of Peru*) El Peru, vol i , by A Raimondi, Lima 1874 (*Col. J Jara Almonte*) De Reizen der Nederlanders naar Nieuw-Guinea in de 17de en 18de. Eeuw, door P A Leupe, 's Gravenhage, 1875 (*C. R Markham, Esq*) The complete works of Count Rumford, vol iv , 1875 (*The American Academy of Arts, &c*). Outline of plan for proposed navigation through the Isthmus of Suez, 1850 (*S M Drach, Esq*). Statistics of New Zealand for 1874 (*The New Zealand Government*). Address by Lieut. C. Weyprecht on fundamental principles of scientific Arctic investigation, 1875 (*Author*). Narratives of the Mission of George Bogle to Tibet and of the Journey of Thomas Manning to Lhasa, edited, &c., by C. R. Markham, 1876 (*Editor*). The Franco-German War, first part, 8th section, Battle of Sedan, translated by Captain F. C. H. Clarke, 1876 (*Q. M. General's Department, War Office*), and the current publications of corresponding Societies, &c.

DONATIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF FEBRUARY 28TH, 1876.—23 Maps of the Government Surveys of India on 55 sheets (*Her Majesty's Secretary of State for India in Council*). Map of British Guiana, 1875, on 4 sheets (*His Excellency the Governor of British Guiana*). A Photographic Relief-map of the Elk Mountains, Colorado, and Preliminary map of South-Western Colorado, and parts of adjacent territories (*F. V. Hayden, U.S. Geologist*). Map of the route of Lieut. Cameron, R.N., from Ujiji to Sha-Kalembi (*Geographical Society of Paris*). MS. map of the Fly River, New Guinea (*Rev. S. Macfarlane*). Photographic map of a reconnaissance of the country to the East of Wady El-Koh, Darfour, Feb. 1876 (*General Stone, Chief Staff, Egyptian Army*). MS. map of the White Nile, from Khartoum to Rigaf (*Lieut. Watson, R.E.*).

The CHAIRMAN, in introducing the subject of the evening, reminded the Meeting that the Rev. Mr. Macfarlane, the author of the first communication, was the gentleman in charge of the *Ellengowan* steamer, now occupied on behalf of the London Missionary Society, in ascertaining what part of New Guinea might be suitable for a settlement of the Mission. He had had the rare good fortune to ascend the Fly River, which Captain Blackwood discovered in 1845, and had reached a spot about 160 miles from the mouth. For the whole of that distance the river flowed through low land, and no elevated tract was discovered where a Mission-station could be established with any safety to health. The people were by no means of the most amiable disposition, and the Expedition had to run the gauntlet of a good deal of hostility, but by making holes through the canoes with their rifles, instead of through the bodies of the people, they succeeded in discouraging any attack upon them. If savage tribes could always be taught the same lesson in the same way, it would be a great blessing both to humanity and civilisation.

1. *Ascent of the Fly River, New Guinea.* By the Rev. S. MACFARLANE.

To Major-General SIR H. C. RAWLINSON, K.C.B.,
President.

Cape York, Jan. 7, 1876.

WE have just returned from an interesting trip up the Fly River, New Guinea, some account of which you will, doubtless, be pleased to receive, as any information from that region is now of special interest.

We started from this port on a missionary cruise on the 29th of November last, accompanied by Lieutenant Chester, the Police Magistrate here, and Signor D'Albertis, Corresponding Member of the Zoological Society, the well-known Italian naturalist, who were pleased to embrace the opportunity we offered them of visiting this part of New Guinea Having called at some of our stations in the Straits, and the adjacent coast of New Guinea, we started for the Fly River on the 3rd of December, taking with us the Chiefs of Katau and Turituri, two villages on the mainland, the people of which are on friendly terms with those at the mouth of the river, to whom we hoped they would introduce us, and act as interpreters We had not been steaming more than five minutes after leaving Katau, when we grounded on a bank, which it was impossible to see owing to the muddy state of the water In half an hour the rising tide had floated us off We generally steam with the flood-tide in dangerous and unsurveyed places, so that, if we run on a reef or bank in smooth water, we are soon afloat again without injury We steered for the passage through the Warrior Reef, but found it too narrow and intricate. Mainou, the Chief from Katau, said there was a better passage nearer the mainland, although there is none marked on the chart, but we felt that we should lose time in looking for it, and, after all, probably be obliged to return and go round the reef, so we took that course at once The weather continued calm, allowing me to get near Bampton and Bristow Islands on the evening of the 5th On the following morning we made for the mouth of the river, and had some difficulty in finding 8 feet of water to float us in As we neared the mouth we got more water, and, when fairly in, we got 5 fathoms

The Katau natives represent the people of the Fly River as being very numerous, and great warriors, and say that they are more afraid of them than of white men, notwithstanding their guns We certainly had not long to wait for evidence confirming Mainou's account of them At the mouth of the river, on the eastern side, there are two large villages, some of the houses being between three and four hundred feet long, such as those described by Jukes in his narrative of the voyage of H M S. *Fly* The river is about 5 miles wide at the entrance, and widens a little about 10 miles up. About 30 miles from the mouth it is difficult to say what the width is There is a large opening to the eastward, which may be another mouth of the Fly, running to the sea, parallel with the one we entered, or it may go meandering in the direction of the Aird River, with numerous outlets to the sea in the gulf. There appeared to be openings to the north, but we believe they are only spaces between islands, the mainland being out of sight. Indeed, it is no easy matter to determine with certainty where the mainland begins, for the country at the head of the gulf appears to be cut up into sections by inlets and rivers.

We anchored for our first night in the river off a small island, about 16 miles from the entrance. Before we reached it, however, the water became very shallow, and in trying to find a passage we grounded, but were soon afloat again by the rising tide. We sent the boat ahead, and sounded on both sides, found the channel, and anchored in 2 fathoms of water We had not been at anchor long, when two canoes hove in sight under sail, apparently coming from the two villages which we had passed Shortly afterwards, five others made their appearance, with five or six men in each, who were waving green boughs as a sign of peace The strong tide, however, seemed to lead them to abandon their intention of coming to the ship The two canoes under sail proved to be from Katau. They had left after us, taking the short route over the reef Their canoes were very small for such a journey, simply trees hollowed out, without (as in the South Sea Islands) sides being sewn to them And yet during their visits to each other they sleep in their canoes, even when on the most friendly terms. This is also the custom on the south-east peninsula, which shows how little confidence they have in each other These Katau men would no doubt explain our object to their friends at the village near which we anchored

On the following morning five canoes came off with about six men in each; they carried green boughs, and were unarmed, and showed their confidence by coming on board and giving us their yams for whatever we offered them They were astonished at all they saw on board, and delighted with all they got We towed two of their canoes to their village 3 miles up the river, the natives remaining on board, and laughing heartily at their friends, who were pulling hard to keep up with us Again we found the water very shallow, barely enough (6½ feet) to keep us afloat Having found deeper water near an island, we anchored to cut wood for fuel Mainou and all the natives said that there was no more deep water beyond that point, and that nothing bigger that a canoe could float, but we did not believe them, knowing than it is customary for the natives to try and prevent a foreigner from going beyond their village The Chief and a goodly number of his people came off to the vessel, with whom we had friendly intercourse, and arranged with the Chief to accompany us on the following day

Next morning we started at 7 30 with the tide, the Chief did not make his appearance nor yet any of his people When we had steamed about six miles we saw five large canoes filled with armed men put off from an island a few miles ahead, they crossed the river and entered a creek on the opposite side, near which we had to pass, shortly afterwards four others issued from the same place, and bore down upon us Had we continued steaming at the rate we were going, they would have met us just about the creek, which was doubtless their intention, in order to have us in the middle and exposed to their arrows from both sides To steam away was out of the question Although the river was broad, the channel was narrow, and with the lead constantly going, we had difficulty in keeping in it Besides, their canoes are so light that they can propel them much quicker than we can steam. Moreover, we had made up our minds not to return on account of the hostility of the natives This at first sight may appear a strange resolution for a missionary to make, but a little consideration will, I think, prove, even to the satisfaction of all members of the Peace Society, that it was humane If we had left the natives with the impression that they had driven us away, they would certainly have attacked the next vessel visiting the Fly with, if possible, greater confidence than they attacked us, and the result, to themselves especially, would have been most fatal They had to learn the superiority of European weapons, and the folly of attempting to capture European vessels, and we felt that it would be decidedly to their advantage to learn the lesson from the deck of a missionary vessel, where we hoped to teach it without loss of life, so our duty seemed to be to stand and fight rather than run away, and the result will prove that we did right

The war canoes contained about twenty-five or thirty men each, two-thirds of whom were paddling, the remainder stood, bow and arrow in hand, ready for action Old Mainou and Aute were greatly excited when they recognised their dress and heard their war cry They were all in war costume, which consists of helmet, shield, and armlet Some of them had plumes of paradise-birds' feathers waving from their helmets, which gave them quite an American-Indian appearance. These were doubtless the chiefs and leading warriors, who by their yells and frantic gesticulations urged on the rowers. Whilst they were approaching, a small canoe with five men in it came off to reconnoitre We got Mainou to shout to them that we did not want to fight, but they laughed mockingly, and asked why we had come to their land They seemed delighted at the prospect of our capture, and from their jeering attitude, were evidently confident of success. But they were counting their chickens before they were hatched, for although we did not desire war we were quite prepared for it, believing that our heads will be of more service to the mission cause on our shoulders than on a pole in the middle of a heathen village up the Fly River

The war party came on, shouting and yelling, and nervously handling their bows and arrows We felt that to allow them to come too near the vessel would probably be fatal to some on both sides, their arrows being poisoned, and it might have been difficult to restrain the crew from firing on the natives after having received a shower of arrows We therefore fired across the bows of the first canoe, which caused them to hesitate for a moment, it was but for a moment, however, for on they came again more furiously than before Bang! bang! and two bullets struck the bow of one of the canoes Instantly the warriors dropped their bows and arrows and seized their paddles, which they seemed to think would render them better service, and pulled as for life. They could not possibly have been more united in the attack than they were in the retreat, and never did their canoes fly over the calm surface of the river so swiftly It was like a regatta Of course we could easily have shot a number of them had we desired to do so, but it was quite unnecessary They saw that, before they could get near enough for their arrows to take effect, our bullets had made holes right through the bow of their canoe, and doubtless they had reasoning power sufficient to convince them that what would go through a canoe might easily go through their bodies In order to deepen the impression we had made, we sent several bullets beyond them as they pulled away When they were about a mile off and had slackened their speed, and appeared to be holding a consultation, Mr Smithurst, our engineer, who has a good rifle, and is a good shot, having been in the volunteer service, dropped a bullet near them, which started them off again, and they did not stop pulling till they got into a creek a long way ahead It is not likely that they will openly attack the next vessel that passes that way We estimated their number to be about two hundred The attack was well planned, and they were evidently waiting for us on that uninhabited island whence they issued, which looks as if our friends of the day before had a hand in the affair As we steamed along, we saw several natives following on the banks for about two miles

On the following day the vegetation on the banks of the river began to change in appearance Here and there were patches of green grass, reminding us of scenes in England Graceful palms of various kinds became more numerous, also the wild nutmeg, mango, and bread-fruit We did not see any more natives till we anchored off a small island, well-wooded at one end, and abounding with the sago palm at the other, about 24 miles from where we were attacked. Here we stopped to cut fuel The captain and crew, also M D'Albertis, had only been on shore about an hour, when three canoes full of armed men made their appearance, approaching from the opposite side of the river We blew the steam whistle to call all hands on board The sight of the boat with so many men in it caused the natives to hesitate. The canoes closed with each other, and there was a consultation, after which they returned to the village We watched their movements with the glass, and soon found that they had only gone for reinforcements to the next village In about two hours afterwards we saw six large canoes coming, containing about 150 armed men, like those of the day before they were dressed in war costume, some paddling, and others standing with their bows and arrows ready, all shouting and yelling as they bore down upon the *Ellengowan* A few shots near them caused them to sheer off round the island We thought that they intended to land on the opposite side, make their way through the bush, and fire at us on board under cover of the trees It was unsafe, however, for the wooding party to land before we knew their movements, hence Mr Chester took some of the crew with him in our large boat and followed them, driving them on to the mainland, and capturing one of their canoes, which we cut up for fuel as a punishment for their unprovoked attack Their canoes are long, narrow, and very light, being well made from a soft kind of wood like yellow pine, cut to a uniform thickness of about three quarters of an inch. The natives are very expert with their paddles, and can propel them at a great rate It would take a smart little steamer to catch them We saw the natives at sunset making a circuitous route for their village In the evening we burnt a blue light and sent up a rocket

We started on the following morning at 8 30 with the flood-tide Several canoes came off as we passed the village of the natives who attacked us the day before, but they were ordinary canoes, and the natives had not their war dresses on. Two of them came near us, one man standing waving a green bough, and another holding up a mat and beckoning us towards them We slackened our speed and made signals for them to approach, as we could not leave the channel, but they would not come within 600 yards They were soon joined by others, till in a short time we counted twenty canoes. With the glass we espied several large canoes filled with armed men in war costume pulling along the bank of the river, evidently trying to get ahead of us, which led us to suspect treachery instead of (as we thought at first) a desire to be on friendly terms with us

They followed us about 12 miles. We fastened a knife and some red binding to a piece of wood and left it floating for them. When they got to what was probably the end of their territory they turned back, afraid, perhaps, of meeting the next tribe.

After leaving this most populous part of the river it became narrower, and the banks better defined. Here and there, as in the Baxter, we noticed the banks to consist of patches of red clay 20 or 30 feet high. Having steamed 28 miles during the flood-tide, we were just going to drop anchor near one of these mounds, where there appeared to be good wood for fuel, when we were startled by the yelling of natives, although neither village nor plantations could be seen. The sound, like the blowing of a war-shell, passed from one to another along the banks of the river till the woods resounded with the echo. Feeling that it was not the most suitable place for cutting wood, we crossed to the other side and anchored a little higher up. At 9 P.M. we burnt a blue light and fired a rocket. No canoes came near us during the night. Early in the morning we heard the same shouting, evidently a call to muster. Soon we saw more than a hundred men assembled on the beautiful green bank of the river, most of them wearing head-dresses of paradise-birds' feathers, and all armed. A canoe came off to reconnoitre, but we could not succeed in getting them near the vessel. They do not appear to have many canoes, and are less warlike than the natives nearer the mouth of the river. Their object seemed to be rather to protect their homes than attack us. The wood-cutting party were not disturbed, and M. D'Albertis succeeding in getting several new specimens of both fauna and flora. We did not see any natives beyond this point, which seems to indicate that the tribes we passed have worked their way from the coast and not from the interior.

Having cut a sufficient quantity of wood, we again started with the tide, and passed quite an archipelago of small beautiful islands, covered with palms and creepers of various shades and forms, the latter hanging most gracefully from the trees in festoons, and trailing their delicate flowers and tendrils in the stream. We had considerable difficulty in finding our way amongst these islands, after passing which the river again narrowed, and the stream became more rapid and much deeper. On Saturday evening, December 11th, we anchored in 7 fathoms of water, and remained till Monday.

After cutting wood, we again started with the flood-tide. The country still remained low and swampy, although it became more open, and the banks of the river covered with long, coarse grass, Towards evening there was a little excitement on board, by our discovering what we supposed to be mountains in the distance. We had all had a good deal of experience in sighting land, and distinguishing it from the clouds, and thought we were not mistaken, as both from the masthead and the deck the phenomenon looked exactly like mountains, partially hidden by the clouds, so we retired that night, hoping to be amongst the hills on the following day. The morning sun, however, dispelled the mountains, and left us in doubt and perplexity as before. Again we cut wood, and again we started with the tide, which did little more than stem the current. The vessel did not swing to her anchor after this, but kept her head pointing up the stream during the rising tide, which still rose about 3 feet. By sunset we found ourselves 150 miles from the mouth of the river. Coming to a sharp bend, where the river took a south-west direction, we dropped anchor in 17 fathoms of water.

Whilst the crew were cutting wood on the following morning, the captain, Mr. Chester, and I, took the small boat and pulled 5 or 6 miles further up the river. We found two channels in the river occasioned by an island, which we took the liberty to call Ellengowan Island, being the highest point reached by the *Ellengowan*, and which we circumnavigated in the boat. We saw the river stretching away to the north-west, broad and deep as ever. It is probable that we might go 100 miles further before reaching mountainous country, as we could easily have seen mountains 60 or 70 miles off. We had already, however, gone beyond the time at our disposal, and our provisions were getting short. Some of our men were already on the sick-list with fever, and the rains were becoming more frequent and heavy. Still, wood had to be cut every day on our return. Moreover, all we Europeans were becoming dropsical. Our legs were like putty—would take any impression. The mosquitoes and other insects were a terrible pest, and devoured us, although we washed from head to foot in kerosine. Over and above all, I felt that the Directors ought to be consulted as to whether they are prepared to establish a mission so far inland, even should we reach high and healthy land and populous villages. For the last four or five days we had not seen any natives, although M. D'Albertis found traces of a hunting party near Ellengowan Island whilst we were away in the boat. We were very reluctant to return, although we felt that both duty and prudence pointed in that direction. If we were not strong enough to work the vessel out of the river, and all became helpless with fever, we had a pretty vivid idea of what would become of us. So we determined to return, leaving the Directors of our Society to decide whether we shall prepare for another trip next season. If we do go, it should be a month earlier, and we must have more time at our disposal.

We commenced our return voyage on the 15th of December. Going up the river, we went with the flood-tide, so that if we grounded we were soon afloat again. To get on a bank when coming down with the ebb-tide, especially when it was just beginning to ebb, would be a serious affair, the thought of which caused the captain considerable anxiety. We had taken notes and made a plan of the river, getting cross-bearings wherever we could. Nothing of importance occurred till we arrived in the vicinity of the natives again. The howlers assembled on the beach as before, and sent two canoes off, but they would not come within half-a-mile of the vessel, and soon returned. Shortly afterwards, one of them put off a second time with a few natives, who had probably volunteered, considering themselves braver than the others. We waved them towards us with a piece of red calico, and made other friendly demonstrations. The leader was standing in the canoe in war costume, with his bow in hand. After gesticulating defiantly for some time, he shot an arrow at us, which did not reach the vessel. We replied with a bullet, which dropped near his canoe, leading him to abandon his intention and his weapons, and seize a paddle and return a little quicker than he came. In order to show them how completely they were in our power and how easily we might injure them if we desired, we sent a bullet near them after they had landed on the bank, and thought themselves safe; upon which they took to the bush, no doubt feeling that it was better to be friendly with such people than to attack them.

On the following day we found ourselves approaching those large villages where we were attacked the second time on our way up. The villages are the largest we have seen, one of the houses being about *five hundred feet long*. Unfortunately the river in that locality becomes much shallower, and contains several dangerous sand-banks. We passed over very shallow places going up, there being scarcely water enough to keep us afloat at times, and we were not sure which side of the river the channel was on. As we approached the villages we saw a fleet of canoes coming out to meet us. Having seen the power of our weapons, we had reason to fear that the attack, if made, would be a most determined one, as their only hope of success lay in their boarding and overpowering us; so we prepared for defence. The deck was cleared, the sheets of corrugated iron put round the bulwarks so as to shelter us from their arrows, our firearms loaded and placed in readiness on the skylight, then, being prepared for an attack, we tried to prevent it. A small canoe, containing three men, came to reconnoitre. We held up hatchets, knives, and red calico, to try and get them alongside, and after a time succeeded in getting them within hail. Mamou called to them in the Kiwai language, which one of them appeared to understand, assuring them that we did not want to fight, and had come as their friends, still they would not come near the vessel. We noticed them looking eagerly from one side of the steamer to the other to find our propelling power, astonished, no doubt, at our moving along without sails or paddles Finally, we put some presents into the boat that we were towing, and let her go astern They cautiously approached the boat, took the presents, and made off When they returned to their friends in the other canoes there was a consultation, after which they followed us in a body, but did not come within several hundred yards of the vessel We made all sorts of friendly demonstrations, without apparently producing any effect—at least, any favourable impression. Having followed us two or three miles, and being near the shallows, which we had such difficulty in passing going up the river, we felt that any accident to us might encourage them to attack us, so we threw a charge of dynamite overboard with a long fusee, which would allow it to sink to the bottom, and them to approach it before exploding Never was dynamite more harmless and effective They felt the shock and saw the water bubbling around them, and appeared utterly bewildered. Those standing in the canoes dropped as if they had been shot, and none of them ventured to pull another stroke towards us, perhaps they feared being blown into the air, or engulfed in the sea! It was just as well that we stopped their progress, for in less than half-an-hour afterwards we struck on a bank and remained hard and fast, which perhaps they were expecting As soon as we touched, the engine was reversed, but the propeller appeared to be jammed against the shore, and could not be moved The tide was rapidly falling, and soon we should have the vessel heeling over if she got down upon her side, it is probable, from her build, that she would fill, rather than rise again, hence we carry chocks in readiness. These were soon driven into the sand and wedged under the angle-iron round her bilge, which kept her quite upright, even when she was almost high and dry. As soon as the tide was low enough to render practicable an examination of the propeller and the bottom of the vessel, Mr. Smithurst reported that the shaft was broken near the boss of the propeller!

Our prospect was now anything but cheering. Hard and fast on a bank so near the top of high-water, that it was doubtful whether the next tide would float us Seventy-five miles from the mouth of the river, and more than two hundred from Cape York! Right opposite the five-hundred feet house, where a crowd of natives were standing watching us, the rain falling, and becoming heavier every day, several of our men down with fever, provisions running short, and our legs looking more like puddings than anything we had seen for many a day! However, there was no time to be lost. The first thing was to try and get the propeller off, as there would be little hope of sailing the vessel with that jammed at the stern After a little trouble we succeeded in getting it out of its place with the broken end of the shaft, to which we fastened a rope ready to haul it on deck when the vessel was afloat The next thing was to carry the anchor out so as to prevent our drifting further on to the bank as the tide rose, then the boat was sent to sound in every direction, to find the deepest water A channel was found between us and the village, and the kedge run out in that direction, after which we wished anxiously for high-water, as the Apostle Paul did for daylight.

In the mean time the natives, who had been watching us from the shore, had taken to their canoes and paddled towards us. They had no war-dresses, were in small canoes, and apparently unarmed We succeeded in getting one of the canoes alongside, and when we had made them some presents, and assured them of our friendly and peaceful intentions, the others came near When we showed them knives and hatchets, and told them that the boat would accompany them on shore to barter for pigs and vegetables, they shouted with delight, saying that there were plenty of pigs, yams, &c, on shore. Mr. Chester went in charge of the boat, surrounded by all the canoes. These were the people who attacked us on our way up, from whom we had taken the canoe, and although they knew something of our power, still we were rather anxious until we saw the boat returning with two pigs and some bananas. The natives had evidently abandoned the idea of attacking us, and were disposed to be friendly. It was now evening, and nearly high-water, and we were all anxiously waiting to see if the vessel would float. To our delight she swung to her anchor, and after two hours' hard work we had kedged her into three fathoms of water, where we anchored for the night.

Next morning we started with the tide, keeping the boat ahead towing. It was dead calm, so our progress was very slow. Two canoes came off with the chiefs of two of the villages, who came boldly up to the vessel and jumped on board, shouting "Mero! Mero!" peace, peace They could speak the Kiwai language, i e the language of the people at the mouth of the river with which Mainou is acquainted, so that through him we were able to converse with them We explained the object of our mission, and assured them that we did not wish to fight, although we were quite prepared to do so if they attacked us They said that they did not want to fight any more, and, according to their custom, hooked their forefinger into ours in token of friendship We gave them a hatchet and a knife each, also a few other small things, which greatly pleased them One of the young men, as soon as he came on board, went down into the engine-room alone, then into the cabin without the least fear indeed the only time he appeared at all afraid was when I suddenly placed him before the large looking-glass in my cabin A light breeze sprang up, to which we spread our sails. Our visitors seemed in no hurry to leave, they had found that it was much more profitable to make us their friends than their enemies, and appeared delighted with the discovery Other canoes came off, and we parted with them all on the most friendly terms It is not likely that they will attack the next vessel that goes that way, so that the Fly River may be considered open to foreigners

Day after day we worked away with the tides, sometimes towing in a calm, sometimes making short tacks against a head-wind, at others gliding along with a fair breeze One day we had quite an exciting race with a log The wind was right ahead, so that we had to make short tacks in the channel The log was being carried down the stream against the wind, and as we tacked, sometimes we found the log before us, whilst at others we were ahead of it, until at the end of the tide we had the satisfaction of seeing the log about three hundred yards astern! We dropped anchor, and held what we had gained, feeling a sort of pity for the log as we saw it carried back by the flood-tide.

In five days from the date of the accident we were delighted and most grateful to find ourselves again at the mouth of the river. We intended calling at Bampton Island on our return, but in our crippled state were glad to avail ourselves of a light, favourable breeze to get clear of the dangers near the mouth of the river We had hoped to spend Christmas Day at Cape York, instead of which we were becalmed amongst the islands in the straits, and had to go in the boat and catch some fish for our dinner! After three days light winds and calms, and a day and a half of a good strong breeze, we arrived safely at this port December 27th H.M. schooner *Conflict* was lying at anchor here, the captain of which had been consulted by the acting police magistrate about sending Merriman's small steamer in search of us.

Several important ends have been gained by our visit to the Fly River

1st We have proved that there really is a navigable river there extending far into the interior of the country, which has hitherto been merely a supposition, as the "large opening" seen by the boat's crew of H.M.S *Fly* might have been simply the outlet of numerous small streams draining that part of the country

2nd We have opened up the way which has hitherto been guarded with great determination by notorious savages, and have taught them, without loss of life, the folly and danger of attacking European vessels

3rd On our return we succeeded in establishing what appeared to be a genuine and firm friendship between the natives and ourselves, exchanging presents, and left them well pleased.

4th We have learnt something of the character of the interior, and although we found it low and swampy up to the highest point we reached, we have at least proved that high land is not to be reached within at least two hundred miles by the course of the river, the first hundred being thickly populated by a mixed race—Papuan and Malayan—speaking different dialects, and at war with each other. They are an intelligent-looking energetic people

5th We obtained a considerable number of specimens of birds, beetles, &c, but as we had a distinguished naturalist—M d'Albertis—on board, I leave him to give his own report of his discoveries in this interesting branch of science. The daily delay for cutting fuel afforded him a good opportunity for collecting

As in the Baxter, so in the Fly River, we were disappointed at not reaching high land with populous and healthy villages suitable for Mission Stations. We hoped to find, as in Madagascar, a dense population in the interior, a hope which we have not yet abandoned, although it has been considerably weakened by the discoveries of our last voyage It is for the Directors of our Society to decide whether we shall go further into the interior or not. We are prepared to make another trip next season, and go as far as the river will allow us, as we now know what arrangements to make for such a voyage.

With reference to the numerous and populous villages in the Fly River, I see no way of conveying to them the blessings of the Gospel except through themselves. To get some of their young men, instruct them, and send them back as teachers, will doubtless take a long time, but it is the only method of reaching them

I remain, yours very truly,

S MACFARLANE

The CHAIRMAN said, all present must have listened with the greatest pleasure to the very interesting Paper, and would rejoice with the London Missionary Society that their representatives had followed the true Apostolic injunction, and had been "wise as serpents, and harmless as doves" They had found means of effectually intimidating the ferocious savages of New Guinea without cost to life or limb

2 *Letter from* OCTAVIUS C STONE, *on his recent Explorations in the Interior of New Guinea, from Port Moresby.*

SIR, Anuapata, New Guinea, Dec 17, 1875

On my return from the interior yesterday I was surprised to find a gunboat, named the *Conflict*, lying in the harbour, having been sent from Sydney to inquire after our welfare, on its way to Port Darwin As it leaves in a few hours for Cape York, I take this opportunity of writing a few brief lines respecting my recent movements

My party consists of Mr Hargraves, of Sydney, and Messrs. Broadbent and Pettard, well known collectors and taxidermists, and we have made three trips inland, but owing to the impossibility of obtaining native carriers, and having, as before intimated, been unable to procure any men in Somerset, all idea of crossing the peninsula had to be reluctantly given up My first trip was to the River Laroki, which I came upon by travelling 9 miles in a N.N.E direction, and find falls into the sea at Manumanu—there called the Manumanu River—(the Lily of Captain Moresby) At this season of the year it is 25 yards wide and 6 feet deep, although its natural banks are 50 yards between, and after severe rains it must be swollen to double its present depth, running now at the rate of 4 miles an hour It runs between a belt of tall trees, and abounds with alligators, while the tracks of pigs and cassowaries upon its mud-shores are not uncommon Birds of many species are very plentiful in its neighbourhood My second trip was to the villages of Omani, Ipikari, and Muninim, situated beneath the shade of Mount Astrolabe, and from which the Laroki receives part of its supply, running as it does between that and the precipitous Vetura Range to the north, and thence in a northerly direction to its first sources among the higher mountains. The natives say another branch of this river falls into the sea at Karo, near to Hula (Hood Point)

Both at Omani and Ipikari we were hospitably received, and in return for small presents made to the Chiefs, they placed before us cooked yams, tarrows, and sweet potatoes

Although I knew this was not the way into the interior, yet I wished to remain the night and ascend Mount Astrolabe on the morrow, but they feared we should lose ourselves, and "our friends (the Motu people) would make war upon them" It was in vain that we endeavoured to convince them to the contrary, and seeing we intended remaining, one of the Chiefs, named Abaka, besought us, with tears in his eyes, to leave, and if we would not, the whole village would turn out As I was loth to cause any ill feeling by turning the whole population of one hundred people from their homes, we marched the same evening to Munimim, 2 miles distant. When they saw us handling the guns while packing up, they were very frightened and thought we were about to shoot them, and, as we left the village, it seemed almost deserted Excepting in the valleys the land is poor, and strewn with pieces of broken rocks and stones, and, though better than in the immediate vicinity of Anuapata Harbour (Port Moresby), possesses nevertheless insufficient inducements as cultivable land The long coarse grass, however, that abounds throughout might be profitably used for the rearing of cattle, as in some parts of Australia The soil is too poor even for the growth of bananas in the neighbourhood of Anuapata and Fairfax Harbour, for although there are some 600 acres under cultivation, yet the produce is far short of the consumption Hence annual trading voyages are made to and from Erima (Cape Possession) and Hula (Hood Point), bringing back sago, arrowroot, yams, and bananas from the former place, and cocoa-nuts and fish from the latter Although we have been here so long, yet we have not seen a banana fit to eat, yams are difficult to procure, and cocoa-nuts impossible, excepting on rare occasions.

The vicinity of Anuapata is the most barren and dried-up looking that one can well imagine. Indeed, the nutriment in such soil is insufficient to support vegetation, and it is on this account that the scarcity of food in Anuapata must be attributed. For want of time, I must quickly pass on to my final trip into the interior.

Crossing the Laroki on a raft, quickly constructed for the purpose, 3 miles further east than the point where we had first seen it, we shortly afterwards arrived at the temporarily-deserted village of Momili, 12 miles distant, where we passed the night. The inhabitants had left on account of the insufficiency of food, and had gone further inland, where it is more plentiful A rivulet, 15 yards wide, rising north of the Vetura Range, flows immediately behind the village, and empties itself further west into the Laroki. This rivulet we crossed five times on the following day, although in returning I found it was only necessary to cross it once in going to Kenimimu, 7 miles further The country now commences to be watered by numerous mountain-streams that intersect it in every direction, and help to fertilise it Several large tracts of level land, with rich alluvial soil, are passed after crossing the Laroki, and these are either quite free, or comparatively free, from any particle of rocky matter. But at Kenimimu the nature of the country may be said *to change entirely*, for the open forest land of gum-trees gives way to mountains covered with scrub and lofty trees, that continue to and even clothe Mount Owen Stanley, or *Birika*, as the highest point is called by the aborigines of the interior. The constant rains among these more distant hills fertilises the entire area, commencing from Kenimimu, and the vegetation becomes tropical to a degree Indeed, no soil or climate could be better suited for the cultivation of sugar-cane, coffee, rice, Indian corn, tobacco, and vegetables Bread-fruit, small melons, cucumbers, betel, and a red kind of corn, called *rani*, resembling gigantic maize, are indigenous, and bananas grow luxuriantly The sago-palm is also indigenous, though scarce—further north it is plentiful—and undoubtedly it could be profitably grown in the interior also Suitable means of transit are the first requirements in this country, and mules could easily go as far as Kenimimu along the present tracks

It is a notable fact that with this marked change of country the bird-of-paradise, hitherto unseen, appears in numbers, though during the present season they are not in full plumage It is the ***Paradisea Raggiana***, the same kind as I found up the Baxter River last September I find three distinct tribes inhabiting this part of the peninsula, namely, the Motu (those speaking the Anuapata language) who build their villages upon the sea-beach, the Koitapu, who have their villages upon eminences overlooking the sea; and the Koiari, who are the most numerous, and occupy the interior, building their villages chiefly upon mountain ridges or high up on the sides Each speak different languages, though the Koitapu and Koiari more nearly resemble one another, being dialects rather than totally distinct tongues. Neither the Koiari-ites or Koitapu-ites differ perceptibly in colour from the Motu-ites, all being of a rich dark-brown colour, with a shade of the copper-coloured Indian intermixed. The dark Papuan, so far as I can learn and believe, does not inhabit the peninsula at all. The Koiari-ites are a strong, healthy, and intelligent people, quick in perception, athletic, active, vivacious, full of expression in their talk, of merry disposition, laughter making and joking Both physically and mentally they are far superior to either of the coast tribes, which is in a great measure attributable to the abundance of food in the interior

I have had no difficulty or misunderstanding of any kind with any of these tribes, but on the contrary have found them a most inoffensive set of savages, friendly disposed, though generally frightened at first sight of us One exceedingly favourable attribute is that none of the tribes in the peninsula are, so far as I can learn, given to cannibalism, in which respect they differ from the pure Papuan

The jovial disposition of these people differs materially from the silent if not sullen and apathetic character of the pure Malay, besides being darker skinned and having frizzy hair The greatest resemblance appears to be in the construction of their language, many words and the grammatical construction of certain sentences being similar to those of Eastern Polynesia In Laval (Yule Island) the natives differ more in complexion than they do here, many there being of a brownish-yellow cast, while at the same time they are a finer-looking people The Motu language extends along the coast from Manumanu to Kapakapa (Round Head), the Maiva (the district including Laval) language extends from Manumanu some miles north of Erima (Cape Possession), and the Hula (Hood Point) language from Kapakapa to some miles south of Hula Koitapu villages speaking their distinct language are found at intervals upon the hills overlooking the sea, commencing with Baroni in Anuapata Harbour and terminating at Hula

Farunumo, 3 miles further than Kenimimu, was the furthest point reached by me on December 9th, which is situated 20 miles in a direct line due north-east of Anuapata Returning a mile I camped close to the village of Matogorogoro, and during the three days I remained there was visited by the Chiefs and inhabitants of both villages, as well as by those from more distant places. All the natives were most orderly, and the Chiefs sent large presents of yams, tarrows, sweet potatoes, bananas, and sugar-cane, which were invariably brought by women, in neatly woven net bags.

There are eight sorts of indigenous sugar-cane, a sample of the best and a head of the large species of red maize having been brought by me with the intention of presenting them to some Botanical Gardens in Australia to ascertain their value. The arms used by the Koiari, Koitapu, and Motu tribes are the spear, which is barbed at one end but is free from poison, a wooden club or sword, 5 feet long with blade 8 inches wide, and stone clubs. The bow and arrow is also used, but very slightly. The spears of the Koiari-ites are carved, and in every respect superior to those of the coast tribes.

It is devoutly to be hoped that no kidnapping parties will be allowed to bring their curse upon these people, who up to the present time have no cause for ill-feeling against the white man, but rather one of friendship. It ought to be cultivated while there is a chance, and before the indiscretion of meddling strangers involves the lives of future travellers.

I have the honour to be, Sir,
Yours obediently,
OCTAVIUS C. STONE.

SIR H. C. RAWLINSON, K.C.B., &c.,
President of Royal Geographical Society, London.

The CHAIRMAN observed that the picture presented by Mr. Stone was a very pleasant one, because it described a race who were neither intent upon killing nor upon eating white men. The people seemed to be of a much gentler and more peaceable disposition than those Mr. Macfarlane had met with further west. He did not know how far Mr. Stone's theory was correct—that the people on the Eastern Peninsula were less hostile because they were well fed, but there could be no doubt that people who had plenty to eat, and were comfortably situated, were generally more placable than those who were starving. The most alarming mobs that ever existed in civilised countries had been mobs caused by famine, which seemed to act with a peculiar insane power of excitement, and therefore a perpetual state of plenty might beget a peaceful disposition. The Meeting was fortunate in having present Captain Evans (Hydrographer to the Admiralty), who was on board the *Fly* during the survey of the shores of the Gulf of Papua in 1845. He would call upon that gentleman for a few remarks.

Captain EVANS said he had listened to the Paper with great admiration of the humanity, as well as of the energy and courage, which had been manifested by Mr. Macfarlane's small party, in pushing their way through the territory of the ferocious savages on the banks of the Fly River. In 1845 he was on this part of the New Guinea Coast for about three months, and the boats of the vessel in which he served (H.M.S. *Fly*) endeavoured to penetrate each of the numerous arms disemboguing in the sea for about 100 miles from the mouth of the river to the head of the Gulf of Papua, but were prevented from proceeding far by the hostility of the natives. Some of the openings were nearly as large as the mouth of the Fly, showing that they must be the drainage of some vast region, for the water was fresh a considerable number of miles out at sea, and in the centre of the gulf drift-trees were frequently met with. Water-communication, in all probability, extended to the great backbone of mountains which runs down the centre of the island, the north-western ranges of which we know are about 16,000 or 17,000 feet high. Mr. Macfarlane's voyage up the river for 160 miles was very remarkable for such a small vessel. He had always been under the impression that this part of New Guinea could never be penetrated except by force, and that two or three steam gunboats would have been required for the purpose. It was really wonderful that the energetic employes of the London Missionary Society should have performed such an enterprising feat.

The Rev. Dr **MULLENS** (Foreign Secretary of the London Missionary Society) said Mr Macfarlane's Paper arrived in England only a few days ago The Directors of the London Missionary Society had long been aware of the great problem that had to be solved in New Guinea, and they cordially approved of what Mr Macfarlane had done They had gone to New Guinea with an earnest desire to find the population, and settle their teachers among them On the occasion of the reading of the Paper on 'The Baxter River,' he stated that the Society had been able, step by step, during the last four years, to get quietly into intercourse with a considerable number of the inhabitants of New Guinea, and they now occupied no less than ten islands in the north-west part of the Gulf of Papua On their very first visit to the coast of New Guinea the Missionaries got into intercourse with the people of Katau, and became acquainted with the Chief Mamou, and by endeavouring to explain to the people that they were anxious to help them and do them good, they had at last been enabled to take the step which Mr Macfarlane had described One point on the coast had been alluded to, namely Yule Island, at the mouth of one of the rivers to the north-west of Port Moresby The more that island was known, the more it was found to be a very useful and healthy position, from which expeditions could be started for the interior It was rather a remarkable spot, three or four miles long, and about 800 feet high in many parts It is, to some extent, of coral formation, and all the country round had a great deal of coral Many streams came out into the bay opposite to which Yule Island had been formed No doubt in former ages a great formation of coral took place, and the fresh water from the interior cut it off from the mainland During his residence of fifteen months on Yule Island, M d'Albertis had discovered a great number of varieties of birds-of-paradise, and hundreds of beetles and other small creatures He treated the natives with great kindness, persuaded them to make little expeditions into the interior, bought their specimens, and, in every way he could, taught them that men who came from abroad regarded them with consideration as human beings like themselves The London Missionary Society intended to occupy Yule Island, and make it an important central station of the Mission that was founded four years ago One Missionary had been residing at the point from which Mr Stone started, and naturalists naturally took advantage of the safety secured by the presence of the Mission Stations The Society was quite willing that they should do so, and would be glad to find that honourable men, anxious to pursue the various branches of science, availed themselves of the stations He quite agreed with Captain Evans that Mr Macfarlane's expedition was a very remarkable one. Like the problem of Columbus's egg, it looked very easy when once it had been accomplished, but why had it been so difficult? Captain Evans had given one of the reasons Every previous endeavour to pierce that Fly River had been attended by contests with the natives, but Mr Macfarlane's party had succeeded in going right through the native district, reaching the more barren regions beyond It would have been a matter of regret, if they had been compelled to return without having any friendly interviews with the inhabitants The breaking down of the propeller at the point where the natives had received a little lesson as to the power possessed by the strangers, was exceedingly providential, as it enabled them to pause and get into intercourse with the people The consequence was that four or five chiefs came on board, and said they did not wish to fight any more They received presents and were well treated, and no doubt a favourable impression was produced upon them It was disappointing, however, to learn that on the Fly River, as on the Baxter River, it was possible to get right through the population Mr Macfarlane's conclusion was, that that portion of the great plain had been peopled from the coast. What had been done was only, after all, a month's work, and the

Society could afford to spend years in laying bare the secrets of such an important island. He hoped that the little steamer would be able to visit the Fly River many times, until the people knew her, and knew the English and native missionaries well.

The Rev. W. **WYATT GILL** said he was on the Fly River about two years ago, and therefore felt a special interest in the subject brought before the Meeting. He was a great advocate of peace principles, but, after all, the right of self-defence must be admitted by the majority of men. The distinguishing mark of a chief in that part of New Guinea was having a string of human skulls at the front of his house. He had examined the skulls at various places in the western part of New Guinea, and in every case they had been battered in, either on the crown or on the side, and the people were cannibals. He was, however, thoroughly convinced that a kindly feeling would result in consequence of their intercourse with Mr. Macfarlane and the other members of the Mission. The chiefs Mainou and Autaa were personal friends of his own, savages as they were. he had learned to esteem them; for as soon as they found that he was bent on doing them kindness, and not on injuring them, the natural feeling in his heart was fully reciprocated by them, cannibals as they were. He believed that, in the course of a year or two, commerce would arise with that river, although he did not think it would ever be a suitable settlement for the white race, because of its unhealthiness. Mr. Stone, however, had discovered a place in the south-eastern peninsula where white men might live. It was a sorrowful reflection to himself that of the Polynesian teachers he took with him and landed in the neigbourhood of Redscar Bay, nearly all fell victims to sickness; but, from the interesting remarks of Mr. Stone, he was persuaded that a place had at length been found where it would be perfectly safe to locate the teachers. He would not venture to predict what the future of New Guinea would be, but he was sure that civilisation and Christianity were making rapid progress there.

Mr. **KINNAIRD** asked Dr. Mullens if he could give some information regarding the cost of the Mission to New Guinea. He had heard that it was remarkably small.

Dr. **MULLENS** said the cost of the *Ellengowan* for the last fourteen months was about 800*l.* or 1000*l.*, besides its insurance. She had a master, an engineer, and a crew of six or eight men. Then there were the expenses for coal, and for the salaries of the three English Missionaries. The cost of maintaining such a Mission was not large; but, at the same time, their opportunities were not very great. The London Missionary Society certainly did not complain of the amount of money annually expended since the Mission first went to the Coast of New Guinea.

The **CHAIRMAN**, in conclusion, said the Society must be gratified at the successful way in which the two Explorations, which had that evening occupied them, had been carried out, and the accession to our knowledge of New Guinea which had been thereby obtained. Mr. Macfarlane's exploring party had shown courage, and that sound judgment which sprang from courage; and the result was, that it was one of the most satisfactory Expeditions he had read of. Every one must hail with great delight the conviction that it was possible, with a due exercise of courage, decision, and judgment, to deal with even the most savage and cannibal races, and yet not necessarily be involved in a war of extermination, and must join with him in hoping that the London Missionary Society would pursue in the same spirit, and with equal success, the task which they had so well commenced.

Ninth Meeting, March 27th, 1876.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*James Biggs, Esq.*, R.N.; *Commander Yelverton O'Keeffe*, R.N.

ELECTIONS.—*A. P. Agar, Esq.; Robert Anderson, Esq.; Nelson Boyd, Esq.; Arthur D. Carlisle, Esq.; Geo. Nugent Conlan, Esq.; Rev. Geo. E. Cotterill; Rev. Joseph Gaskin; Wm. Edward Hall, Esq.; Edward Henry Hancock, Esq.; T. W. Masterman, Esq.; Commander Yelverton O'Keeffe*, R.N.; *Captain George Saint Claire Stevenson; Wm. Livingston Watson, Esq.*

DONATIONS TO THE LIBRARY, FROM MARCH 13TH TO 27TH, 1876.—Catalogue of Maps, &c., of India and other parts of Asia, 1876 (*H.M. Secretary of State for India*). The new law regulating military service in Russia (*War Office*). List of Fellows of the Royal College of Physicians, 1876 (*The College*). Summary of the late Dr. Beke's published works, by Emily Beke, 1876 (*Authoress*). 56th and 57th Annual Reports of the Trustees of the New York State Library for 1873 and 1874; Report of the Regents of the University on boundaries of the State of New York, 1874; Annual Report of Canal Commissioners of the State of New York, 1875; and Annual Report of the State Engineer and Surveyor, 1874 (*The New York Senate*). Report of U.S. Geological Survey of the Territories, vol. ii.; Vertebrata of the Cretaceous Formations of the West, by E. D. Cope, 1875; and Summary of the Field-work of the Hayden Geological Survey, 1875 (*Dr. F. V. Hayden*). Annales hydrographiques, Nos. 542, 543, 545, and 547 (*The French Marine*). 3 Reports on Mount St. Elias, the harbours of Alaska, and geographical and hydrographical operations on the coast of Alaska, by W. H. Dall, 1873, 1875 (*Author*). Leitfaden der Geographie von Europa, von Carl Sonklar, 1876 (*Author*); and the current issue of publications of corresponding Societies, &c.

DONATIONS TO THE MAP-ROOM FROM MARCH 13TH TO 27TH, 1876.—Map of Lieut. Cameron's route across Africa; Map of the Mai-kassa or Baxter River, New Guinea; Geological map of Europe, by H. Habenicht (*Dr. A. Petermann*). 46 sheets of French Charts (*Depôt de la Marine*). 11 sheets of a Topographical Atlas of the United States west of the 100th meridian (*Lieut. G. M. Wheeler, U.S. Army*). MS. map of the Southern portion of Dominica, West Indies (*G. B.*

Blanc, Surveyor-General) 380 sheets of Ordnance Surveys of Great Britain (*H.M. First Commissioner of Works, through Major-General Cameron*). 4 School Atlases, by Marcus Ward & Co (*The Publishers*). MS map of Old Calabar and Qua Rivers (*Captain J. B. Walker*). Map of part of the North-West Territory, Dominion of Canada (*Captain S. Anderson*, R.E.) 4 Photographs of Views in Colorado, U.S. (*Prof. F. V. Hayden*)

LIEUTENANT CAMERON

The PRESIDENT announced that Lieutenant Cameron was now on his way home, and, according to all reasonable calculations, would arrive in England during the current week. He had received a telegram from him from Madeira, stating that he was to leave that place on Saturday morning last, and another telegram had just been received from our associate, Mr. James Irvine, at Liverpool, running thus:—"The Meeting to-night may wish to have positive news regarding Lieutenant Cameron's arrival, therefore I telegraph that the *Congo* cannot be in before Saturday at noon, and with these winds it will most likely be Sunday." With regard to the reception of our traveller, the Council proposed that he should appear before the Society at their next meeting, and in order to provide sufficient accommodation for the Fellows on that occasion, it had been thought necessary to engage St. James's Hall for the Meeting. But as that Hall was always engaged during the season on Monday, our Meeting would have to be postponed to Tuesday. He had every reason to hope that His Royal Highness the Duke of Edinburgh would preside, and he trusted that the members would attend in large numbers in order to do honour to Lieutenant Cameron.

The PRESIDENT then introduced Captain Anderson to the Meeting, remarking that the Paper he was about to read referred to the proceedings of the Commission appointed to define the boundaries between the United States and Canada.

The North-American Boundary from the Lake of the Woods to the Rocky Mountains. By Captain S. ANDERSON, R.E.

[ABRIDGED.]

THE international boundary-line between the British possessions in North America and the United States in the central part of the continent, from the Lake of the Woods to the Rocky Mountains, was established by treaty in 1818, but more than half a century elapsed before the necessity arose of surveying and marking the boundary-line on the ground.

The Red River Valley was long ago known to be partly in British and partly in United States territory, but in the early stages of the history of the Red River colony all its settlers had come from the British side, and no international question arose. The French fur traders of the North-West Company, penetrating from Lake Superior to the westward, across a most difficult country of lakes and swamps and rocky ridges, had come upon the Red River Valley early in the eighteenth century, and must have realised its great capabilities for settlement.

The Hudson's Bay Company, advancing southwards from their head-quarters at York Factory on Hudson's Bay, by an equally difficult route, had in the early part of this century reached the prairie-lands of Red River The sole object of these rival companies was the fur-trade, and they had no interest or desire to open up the country for an agricultural population, or to press for a settlement of the question as to the precise position of the boundary-line.

In course of time some adventurous and independent traders of the Red River colony explored southwards, following the course of the Red River to its source, and then, crossing the plateau of swamps, came upon the head-waters of the Mississippi, and thus explored the way for developing the natural outlet for the commerce of Red River to the American settlement of St Paul at the head of navigation on the Mississippi The emigrants coming to Minnesota, and finding the country to the westward a wild, dreary waste, unfavourable for settlement, pushed forward to the north, down the Red River Valley, and established themselves on the river-bank down to, and even across the frontier Early in 1857 a Government expedition, under Captain Palliser and Dr Hector, was despatched from England to examine the country between the Red River and the Rocky Mountains, and the extensive explorations of these gentlemen in 1857 and the two following years formed the basis of all subsequent surveying operations in the north-west territory In 1869, on the creation of the Dominion of Canada, the territorial rights of the Hudson's Bay Company were sold to the New Dominion, and after the peaceful settlement of the rebellion in Red River by the expedition under Sir Garnet Wolseley, the colony was made a province of the New Dominion, and the route through British territory, following generally the old canoe-route of the French fur-traders, having been made practicable by Sir Garnet Wolseley, was improved by the Dominion Government at a great cost, and emigrants were encouraged to settle in the new province New settlers came in from the south, and, to some extent, from the east by the new route, and established themselves in the valley. In 1872 there was no white settler on the British side south of Fort Garry Near the supposed site of the boundary some twenty years ago the Hudson's Bay Company had established a trading-post, where the Chippewa Indians of the district traded their furs. It was contended by the United States authorities that this trading-post was on the American side of the line, and this contested point remained in abeyance till the British and United States Governments agreed to appoint a

Commission to settle the matter, and at the same time to complete the demarcation of the boundary-line across the continent, from the Lake of the Woods to the Rocky Mountains

On the 15th of June, 1872, the North-American Boundary Commission was organised under Major Cameron, R A, Her Majesty's Commissioner, and at the same time four Engineer-officers and a detachment of forty-four Royal Engineers were selected to serve on the Commission A contingent of surveyors and assistants, as well as a surgeon, veterinary surgeon, and geologist, were appointed by the Dominion of Canada In order to ascertain and mark the international boundary-line with the greatest possible accuracy, the best class of portable instruments was provided, and with the advice of the Astronomer Royal, under whom the Engineer-officers were instructed in the special duties required of them, the specification of such instruments as were best adapted for the work was prepared, and the whole order was entrusted to Messrs Troughton and Simms, who, with the greatest skill and energy, applied the whole of their staff to the execution of the order As soon as the equipment and outfit were ready, the officers and detachment of Royal Engineers left Liverpool on the 22nd of August, 1872 Proceeding *viâ* Quebec and the Canadian Lakes, the party travelled, by the courtesy of the United States authorities, through the State of Minnesota by rail to the head-waters of Red River, thence, partly by marching and partly by river-transport, reached the frontier at Pembina on 20th of September

Here the contingent of Canadian officers and employés reported for duty, and the Commission appointed by the United States were also assembled at Red River in readiness to commence astronomical and surveying operations in concert with the British Commission

The season was already well advanced, and the first experience of the joint Commission in camp on the Red River prairie was a violent snow-storm from the north-west, which raged with great fury for three days, and greatly delayed field-operations. The settlers foretold that this was the harbinger of fine autumn weather, which proved to be the case, for during the month of October bright and genial weather prevailed, with a sultry, hazy, and motionless state of the atmosphere, popularly known throughout Canada as the Indian summer

The position of the boundary-line at Red River was determined by astronomical observations taken independently by the British and United States Commissions with the aid of the Zenith telescope, an instrument of American invention, and admirably adapted for the boundary work on account of its portability, the simplicity of the observations and subsequent calculations, and the great accuracy of the results The time occupied in determining the latitude of a station was about seven days, three clear nights being sufficient for the observations, and at Red River the final results of the two Commissions differed by 32 feet only This difference was halved, and the position of the boundary line, as then agreed to, confirmed the observations that had been previously taken by Captain Palliser, and Mr Sullivan, his secretary In order to make the most of the open weather during the month of October, three astronomical parties were organised by the British Commission, one of them commencing work at an intermediate point between Red River and the Lake of the Woods, and the other two parties proceeded to the Lake of the Woods to commence operations there in concert with the United States Commission

A difficulty presented itself at the outset as to the exact position of the north-west point of the Lake of the Woods, determined by a former joint Commission in 1826 being the terminal point of the operations under that Commission and the initial point of the work of the present Commission under the treaty of 1818. The point was described as being in a swamp, and as there was no firm ground in the neighbourhood, a pyramid of logs was constructed in 1826 about one mile south of the spot, at an exact specified distance from the point which the Commissioners at that date had agreed upon as the north-west corner of the Lake of the Woods, specified by the treaty.

All traces of this wooden pyramid had disappeared, but the traditions of its construction were fresh in the memory of the Indians, and, guided by the direction of an old man of the Chippewa tribe, some younger members of his family indicated to us a spot, then 18 inches under water, in the swamp of the district, from which spot an oak-log was dug up in our presence We were further aided in our investigation by some additional particulars communicated by Mr Barclay, the British Commissioner of 1826, who, I am happy to say, is still alive, and, though at an advanced age of about ninety years, retained wonderful recollection of the circumstances connected with the question now referred to him. An independent investigation from our own observations and measurements indicated the restored site of the old pyramid, only 400 feet distant from the site pointed out by the Indians. This extraordinary agreement left no reasonable doubt that we had found the old site, and the Indian site was accordingly adopted, and served as the starting point of the operations of the new Commission. The point occurs in a grassy marsh, covered by 3 to 4 feet of water, and is represented in the picture, copied from a photograph taken on the spot

The international boundary-line, starting from the north-west point of the Lake of the Woods, follows, by the terms of the treaty, a due-south line for 26 miles to its intersection with the 49th Parallel in the open water of the lake For the first 16 miles the boundary-line cuts off a promontory of the western shore of the bay, passing over a continuous swamp more or less wooded, as shown in the accompanying plan and special survey of this locality. In the northerly portion of the line the timber is dense, consisting of birch and tamarac, or species of larch, and a great entanglement of fallen timber covers a treacherous swamp, having a mossy surface, which gives way under foot, and underneath is mire and water of varying depth

The cutting and surveying of this line was attended with considerable hardship and difficulty, camp-equipage and provisions being transported on men's backs, and for this service, as well as for clearing the line, the working parties consisted principally of Indians

The natives of the Lake of the Woods are most independent, and little inclined or physically able for continuous hard work It became necessary to humour them a little, to prevent them from abandoning a work which necessitated their being knee deep in water and mud all day Their great spokesman, who is known throughout the country by the name of Colonel Wolseley, began with a great flourish, and very soon disabled himself with his own axe, and eventually settled down very comfortably as cook of the party. He was famous for the extraordinary load of miscellaneous baggage that he could collect into one bundle and carry on his back, with the portage strap across his forehead, and jump from log to log when shifting camp down the cutting

The Indians would only work on condition that we would take care of their wives and families during their absence. Twelve or fourteen families, accordingly, arrived and set up their lodges close to the observatory-camp, and an occasional issue to them of a little flour and bacon was honestly divided among their number, and used with surprising economy During the progress of the work the frost set in early in November, and travelling through the swamps became easier, though an early fall of snow prevented the swamps from being coated with a strong layer of ice, and the ground continued to be treacherous till the snow along the travelled trail had become well consolidated by constant foot-traffic.

The due-south line passes almost insensibly from swamp into the open lake, the timber becoming more and more stunted, merging into willow-bushes and coarse reedy grass The actual lake-shore was indicated by a sandy beach, on which a few willows struggled for existence, and the surf, which had beaten violently on the beach by the southerly winds, had now become frozen into most fantastic forms, while the floating ice, which had been drifted to land, was now packed into a rugged and confused mass, which extended for some distance into the lake, and blended at last with the wavy covering of ice which held the surface of the lake fast Inland from the beach a belt of open marsh, fully a mile in width, had become coated with glare ice, 2 feet in thickness, and this ice, which had formed under more peaceful conditions than that in the open lake, was as clear as crystal, and strangely beautiful

The boundary-line continues southerly for 10 miles across the open lake, and intersects the 49th Parallel at a spot in the lake where the soundings taken through the ice showed 30 feet of water Proceeding then due west for 6 miles, the boundary-line intersects the western shore of the lake, at which point a series of observations was taken by the joint Commission on a little sandy ridge, where a few poplar-trees were found, and the only dry spot for miles available for a camping-ground In full view, on the southern shore of the lake, an independent band of Indians was established, who cultivated some small patches of land, and owned a few cows, the only remaining evidences of the civilising influence of the early French traders who settled at the Lake of the Woods a century before the conquest of Canada, and of whom some faint traditions were told to Sir Alexander M'Kenzie on his first visit to the Lake of the Woods in 1789. The thriving trade which appears to have existed at the Lake of the Woods in furs and fisheries in the time of the early French traders, 200 years ago, has now almost ceased, partly on account of the supply having failed, and partly on account of the diminution by war and smallpox in the numbers of Indians now inhabiting the shores of the lake.

The initial point of the 49th Parallel on the western shore of the lake was marked on the ground jointly by the British and United States officers in November, 1872, when, after an elaborate series of observations by both Commissions, the independent results when staked out on the ground showed an overlap of territory that might have been covered by the big map now before you. The actual difference was 29 feet, and this was most amicably halved, and the intermediate point agreed to as the initial point on land of the boundary-line

The further survey and marking of the line over 90 miles of country intervening between the Lake of the Woods and the Red River was accomplished during the winter of 1872–3, by astronomical parties working from both ends This region had hitherto been a terra incognita unexplored by white men, and described by the Indians as a vast and treacherous swamp The swamps were found to be quite impassable for wheeled vehicles or pack-horses during the open season, but by making a detour from Red River towards the south for 25 miles, access was obtained to a point on the boundary 57 miles east of Red River From this point progress in an east or west direction was impeded by swamp, and the work was continued with much difficulty till winter set in, and the surface of the swamps gradually froze As the winter advanced, and the snow increased in depth, the working-parties were supplied with leather clothing and extra buffalo robes, and the men readily acquired the use of snow-shoes, while the transport of stores and provisions to the most advanced parties was accomplished by dog-trains

Although it was generally supposed that as soon as winter set in field operations would necessarily be suspended, it was found that the advent of the frost afforded the greatest assistance to the work, for both men and transport-animals were spared the excessive fatigue of working through the unfrozen swamps. It was soon ascertained, too, that the winter was the only time in which the country between Red River and the Lake of the Woods could be surveyed, as the swamps were found to be almost continuous, and only intersected at intervals by narrow belts of timber

Although the cold at times was intense, the thermometers often showing 45° below zero, and on one occasion 51° below zero, the working-parties were for the most part protected at night by the woods, and during the day, as long as the air was still, no great discomfort was experienced The least wind, however, caused much suffering and frequent frost-bites. In using the astronomical instruments, care had to be taken not to touch the metal of the instruments with the bare hand The observer would occasionally find his eyelid frozen to the eye-piece of the instrument, as experienced by the Russian engineers in Siberia On the march, in a cold wind, the eyelids would be often, for the moment, frozen together.

A severe snow-storm swept over the country on the 7th, 8th, and 9th of January, 1873, causing great loss of life in Minnesota—farmers, with their families, being caught by the storm, and frozen in the drifting snow close to their own houses. I was out in the open country at the time, travelling on snow-shoes, in company with two attendants, and a dog-train carrying blankets and provisions. The dogs were stung so pitilessly in their eyes and ears by the drifting snow, that it was difficult to get them to face it, and they continually rolled over on their sides, and buried their heads in the snow. Shelter was eventually found in a small island of poplars, and we kept ourselves alive by huddling round a fire which we kept going for about eighteen hours, when want of food compelled us to continue our journey. The next day we reached an Indian camp, where we were most kindly received and cared for. The last part of the journey was across the open lake, and the true direction of travel could only be kept by running in the teeth of the storm, which happened to be as good as a compass-course. Nothing could have made the dogs travel at the last except their wonderful sagacity in discovering by scent that there was an Indian camp in front of them, although they had still some miles to go before reaching it. Not the least distressing trouble was having one's face stifled by a muffler, which soon became frozen solid to one's face and beard by the moisture of breathing. It thus became necessary after a few hours' travel to halt, and, if possible, to get into shelter, and make a fire and thaw out one's face to prevent suffocation.

This storm caught all the working-parties of the British Commission at different points where they happened to be at the time, but fortunately caused no loss of life, though two men, who were driving a pair of horses in a sleigh carrying supplies, were caught by the storm in the open prairie, and being unable to proceed or go back, they lay in the bottom of their sleigh for two days and nights, and were at last rescued, without having suffered permanent injury. Their horses, which they had let loose, found their way back to the point from which they had started, and thus gave the alarm which caused the despatch of relief to the sufferers.

Although the prevailing weather during the winter months was cloudy and stormy, there were occasional days and nights of clear weather and motionless atmosphere. On these occasions the thermometer would show the greatest degree of cold, and in the woods one audible evidence of the intensity of the cold was occasioned by the freezing of the sap in the trunks and branches of the trees, and the consequent bursting of the bark with a report like pistol shots. This chorus would continue through the night, and the frequency and violence of the reports would afford a good comparative measure of the cold.

On these clear nights the auroras were most brilliant, vapour-like, and yet perfectly transparent, so that even the smaller stars could be distinctly seen through the illuminated mist. One of the grandest that I witnessed formed a canopy in the zenith, and shot out on all sides towards the horizon radial flashes of light, ever varying in length and breadth, now advancing, now retreating in a dissolving view, and lighting up the heavens with the glow of early dawn

In order that the geographical position of the boundary line should be accurately determined in longitude as well as latitude, advantage was taken of a line of telegraph connecting the Red River Settlement with the United States, to exchange telegraphic signals for the determination of the difference of longitude between our observatory camp at Red River and the United States observatory at Chicago. Nine hundred miles of wire were placed in continuous circuit, and instantaneous comparisons of the local time at the two ends were made on five successive nights, simultaneous with observations on the stars, for the determination of the local time at each place. Considerable arrangements were necessary to have a staff of observers in readiness at each end, and for the telegraph-line to be connected throughout, and to be kept clear of other business during the time of the longitude signals In mid-winter the insulation of the wire was perfect, and this long circuit of 900 miles was worked without difficulty, and the longitude of Red River Astronomical Station was determined with a probable error of less than 100 yards, with reference to the meridian of Chicago, which had previously been connected with Greenwich. This result will be of the greatest possible importance in the future, as it will be the starting-point of all future surveys in the central portion of the continent, where the accurate geographical positions of important points had hitherto been so little known, that the official maps showing the north-west point of the Lake of the Woods had an error of 4½ miles in longitude.

On the breaking up of the winter, early in April, there was an interval of about six weeks in which no field operations could be carried on, in consequence of the whole country being flooded by the rapid melting of the snow, and vegetation made little or no progress till the middle of May, by which time night-frosts became less frequent At that season, one warm day followed by a warm night was sufficient to make the whole surface of the prairie green with new vegetation springing into life, and at the same time mosquitoes began to swarm in myriads, and continued to increase in numbers and ferocity as the spring advanced.

In order to make the most of the short summer season of about five months, arrangements were made to distribute the working parties simultaneously over about 90 miles of boundary, and attack the work at several points at once. To do this advantageously it became of the utmost importance that the country should be well explored and reconnoitred, in order that no delay should occur to the several working parties proceeding at once to take up the work at convenient points This work of exploration was accomplished by a reconnaissance party consisting of thirty scouts, selected from the Red River half-breeds They were mounted on their own ponies, and armed with Spenser carbines. The scouts were lightly equipped, and formed the escort to the reconnaissance officer, by whom the necessary astronomical observations were made for latitude and longitude, and at the same time a reconnaissance map of the country was prepared, showing all important features. The best route for travel was explored and marked out, the most suitable spots noted for halts and encampments, and depôt sites were selected for storing and distributing supplies The approximate position of the boundary line, at points where more accurate observations were to be taken with the zenith telescope, was also marked, so that the astronomical parties were able at once to proceed to their destinations, and set up their fixed observatory instruments within 100 yards of the boundary line

Of the country to the westward of Red River very little was previously known. The fine alluvial prairie of the Red River valley was found to extend for 35 miles to the westward, and then to be bounded by the first prairie steppe, called Pembina Mountain, an ancient shore-line which was conspicuous for many miles before reaching it from the eastward, as an unbroken ridge of bluish colour, with elevated table-land beyond This ridge proved to be wooded with a small, though dense, growth of poplar, and the boundary line, after passing through 8 miles of rough ground, came upon the gorge of the Pembina River, which flows in a deep ravine 350 feet below the table-land, and 3 miles in width from summit to summit. In this district during the month of June, 1873, locusts were being hatched in swarms, and in sunny situations, but especially on the logs of fallen trees they were most abundant. They were only in the crawling stage at that time, but they subsequently took flight, and completely devastated the crops in the Red River valley

In consequence of the ground being much broken at the boundary-line in Pembina Mountain, the line of travel for heavy waggons was diverted 8 miles to the north, where the river was found to be fordable after the spring-floods had subsided. After crossing the Pembina River, an ascent is made to the Upper Plateau and to the commencement of the Great Plains which extend in one vast expanse, more or less broken, to the base of the Rocky Mountains, 700 miles distant The Great Plains resemble a land-sea, sometimes perfectly level, at other times abounding in hillocks and undulating ground, and occasional prominences rising 30 or 40 feet above the general level of the plain, are met with, from which a panoramic view can be obtained to the horizon 10 or 12 miles distant. From these elevations the vastness and solitude of the plain can be seen and realised A clayey soil, with some admixture of sand, supports a stunted growth of prairie-grass, growing in bunches, and in every direction across the plain buffalo-tracks, like old pathways, are distinctly marked, and in many places the bleached skulls and bones of the buffalo are scattered about, in evidence of the vast numbers that must formerly have grazed over this district, and of the wholesale slaughter that has practically exterminated them in this section of country During the last sixteen years the front of the buffalo has been driven back 200 miles westward. The only signs of life that now attract notice are the innumerable badger-holes with which the plain is honeycombed, and the soil is frequently found to be fresh and newly-disturbed by these indefatigable animals attempting, as it were, to bar the progress of the rider by countless treacherous pitfalls In proceeding to the westward along the boundary line, the first section of the Great Plains is found to be 70 miles in width Over this area there is, in common with the whole tract of plain in the central part of the continent, no rainfall during the summer months except from passing thunder-storms, and the growth of the scant prairie-grass during the months of May and June is altogether dependent on the moisture derived from the melting of the winter's snow, the snow-water collecting in hollows forms pools which supply moisture for some weeks during the early summer to the adjoining soil But for this circumstance the excessive heat of the sun during the month of June, and the want of rain, would convert the prairie-surface into a sterile waste Patches of good grazing-ground can be found in all directions; but in consequence of the summer drought and the exposure of this area of plain to the cutting winds from the north-west, the soil is not suited for the growth of cereals, but there will always be abundant pasture The short grass that comes to maturity in the moist hollows and undulations of the plain is most nutritious, and grazing animals would fatten on it rapidly were it not for the incessant mosquito plague, which drives the domesticated animals almost wild and keeps the strong ones from gaining flesh, and the weaker ones die if they are put to any hard work.

After crossing the 70 miles of plain, levelled in former ages by the great drift which has left great boulders of granite and limestone stranded in all directions, a curious elevated and thickly-wooded district occurs, extending for 34 miles along the boundary, and this feature, known as Turtle Mountain, from its shape, as seen in the distance, resembling in appearance the head and body of a turtle, commencing in United States territory, protrudes for 8 miles across the line into British territory, where the principal portion of the wood occurs, in consequence of the ground having a northern exposure. * The wood is chiefly poplar, but oak and white birch, and the ash-leaved maple, are also found, and some of the poplar-trees, in sheltered places, are 2 feet in diameter The interior of the mountain abounds in lakes and swamps, so large and numerous that the Indians were of opinion that we should fail in our attempt to survey and mark the boundary in a continuous line across the mountain The difficulties pointed out by the Indians were not exaggerated, for it turned out that the boundary, in its course of 35 miles in Turtle Mountain, crossed sixty-five pieces of water, of which twenty-five are true lakes, with gravelly shores, necessitating a survey by triangulation instead of the ordinary method by direct chaining The hill-sides supported a luxuriant growth of wild pea, on which the horses fattened rapidly, and the water, though stagnant, was generally good.

A party of British surveyors and axemen was occupied during the whole season of 1873 in tracing the boundary through the mountain for 24 miles to the eastward, when a junction was effected with a working party of the United States Commission, who had entered the mountain from the east and traced the boundary-line westward for 10 miles, when further progress from that side was barred at the time by a lake more than a mile across, and extending for some distance into British and United States territory The vivid greenness of the woods and the solitude of these well sheltered lakes, made many parts of the mountain singularly beautiful, and the melancholy cries of the loon or northern diver alone disturbed the peacefulness of the scene. Red deer and bears are found in the mountain, and are hunted by a few families of Sioux Indians, who, though belonging properly to United States soil, have taken refuge on the British side since 1862, when they massacred the American settlers in the upper portion of the Red River valley

This district of Turtle Mountain will be invaluable to settlers in the future, furnishing, as it does, an ample supply of wood for building purposes, and fuel and wintering-ground for stock, while the adjacent plain will serve as grazing-ground during the open season. During the operation of the Boundary Commission a depôt was kept up here for storing supplies, and a large storehouse of poplar-logs was constructed, in which the care-takers lived during the winter months. Communication with head quarters at Red River was somewhat precarious during the winter, except with dog-trains, but the more northerly settlements in Red River are of easier access, in consequence of intervening strips of timber, where travelling in winter time would be less dangerous than crossing the 70 miles of open plain immediately to the eastward

The effect of the wooded area of Turtle Mountain is very marked in attracting rainfall from the clouds, while the surrounding plain suffered from drought. The thunderstorms especially seemed to discharge themselves over the mountain with terrible violence, and the lightning appears in balls of fire, plunging into the ground, and in such quick succession of flashes that at night the air seems to be continuously illuminated On the hottest days there would be occasional hailstorms, and the hailstones were sufficiently formidable to penetrate the canvas tents and to stampede the horses. The hurricane that accompanies the thunderstorm frequently lays low every tent in the camp, and converts the plain for the time into a vast lake In the course of half an hour every symptom of the storm will have disappeared, and the mosquitoes will have renewed their attacks fiercer than before From the highest point of the boundary in Turtle Mountain the boundary-marks can be distinctly seen with a telescope for 15 miles, and with a marked curvature to the north, due to the parallel of latitude Thus a practical illustration is afforded of the form and figure of the earth

The Great Plains continue beyond Turtle Mountain for 138 miles, at an average elevation of 2000 feet above the sea, and the only breaks that occur in the monotony of the scene are occasioned by the Souris River, which, in its meandering across the plain, has cut out a valley of varying width from one to two miles, and 150 feet below the plain In the shelter thus afforded some timber grows on the bank of the stream, and there is an abundance of good pasture at all seasons The operations of the Joint Commission in this portion of the country were greatly assisted by this valley, which crossed and recrossed the boundary several times, and always afforded good camping grounds

At one point in the Souris Valley, near the boundary-line, occur some remarkable rocks, known as Les Roches Percées, which have long been objects of superstitious veneration by the Indians. A soft sandstone, which underlies a capping of harder stone, has weathered into most curious figures, some castellated, and the whole series presents the appearance of ruined dwellings, which the Indians believe them to be. The soft rock bears in many places rude Indian carvings with birds and other animals. One of the most curious rocks, with a window-like opening, has been reproduced from a photograph.

No difficulty was experienced in tracing the boundary-line continuously across the Great Plains, but the constant mirage greatly delayed surveying operations during the day, for over the whole prairie-surface the air was in continual agitation, and on looking through the telescope at a distant flag-staff, the latter was observed to dance with persistent contortions, and no observations on terrestial objects could be made from point to point with accuracy except in the early morning or late in the evening. Unhappily when the flag-staves were at rest the mosquitoes were most active, so that the observers had not an easy task.

The general level of the plain is not disturbed for 120 miles west of Turtle Mountain, but a warning of some change in the character of the country is given by a low-lying ridge bounding the distant horizon to the westward, forming a coast-line to the land sea beneath it, and this feature, which becomes less and less defined as one approaches it, is the Great Coteau of the Missouri, and is one of the most important features of the western plains. It is the second prairie steppe of the North American continent, and crosses the country from north-west to south-east. This coteau, or prairie steppe, leads to a very remarkable plateau of an average elevation of 2250 feet above the sea, and is broken up in a succession of ridges, valleys, and basins, presenting in section a very broken and irregular profile. The boundary-line for 50 miles crosses the great coteau district, and over the whole of this distance there is no well-defined ridge or water-course, but the same confused monotony of ridges and hollows. These are succeeded to the westward by a more undulating country, in which large alkaline lakes occur, and as the waters evaporate during the summer, a white saline deposit remains on the shore-line, which contrasts strikingly with a crimson plant, the *Salicornea*, which fringes the salt-lakes, and at once marks their brackish character. The chain of salt-lakes extends in almost an east and west direction for 15 miles, and over the whole of this district, including the Great Coteau, the waters have no outlet to the ocean. We are thus on the central waterparting of the continent, for the waters we have left find their way by the Red River into Hudson's Bay, while the ravines that are now opening out to view towards the west drain southwards to the Missouri, and find their way to the Gulf of Mexico. A great change is now observable in the topographical features. Owing to the nature of the soil, which is of clay and very friable, denudation proceeds very rapidly during the short period that the soil is saturated with the snow-water, and the valleys are often scarped by deep and almost vertical sides, which in many places become baked by the heat of the sun and resemble retaining walls. The peaks and ridges of the clay-hills are weathered into most varied forms, some turret-shaped and others conical, and in many places the peaks and ridges are capped by a natural brick material, burnt to a red colour by the combustion of the beds of lignite or tertiary coal, which is scattered through this clay formation The soil is unable to support vegetation, and this rugged and desolate country, which somewhat resembles the wilderness of Judæa, is called by the half-breed hunters "Les Mauvaises Terres" The principal portion of this semi-desert occurs on the United States side of the Boundary-line, but a wedge shaped area of bad lands or barren soil protrudes into British territory, measuring at its base on the boundary 7 degrees of longitude, or about 320 miles, and tapering off northwards to a point near the great elbow of the Sascatchewan, 125 miles north of the line In the central portion of this triangular district the plateau has on its north side a few sheltered ravines, containing small groves of poplar and good pasture adjacent This locality, which is of very limited area—probably 36 square miles in all—was for some years, until recently, the winter residence of about eighty families of half-caste hunters, who, though originally belonging to the Red River Settlement, twenty-five days' journey to the westward, were forced by the migration of the buffalo to travel so far westerly in pursuit of their game that they were unable to return to Red River during the same season. They consequently abandoned their old home, and established their winter quarters nearer the buffalo country. This site, known as Woody Mountain, had been visited by many of the old half-breeds of Red River, and, though it was supposed to be in British territory, it had never been visited by any traveller competent to determine its geographical position It was consequently a matter of great importance that the reconnaissance party of the British Commission during the first summer season were able to push so far to the westward as to discover the position of this oasis in the middle of the semi-desert, and but for the happy accident of meeting with a party of Sioux Indians, who said they had just come from a hunters' encampment, a long day's journey to the northward, this site would not have been discovered that season, for it lay concealed among the ravines on the reverse or north side of the plateau It proved to be 22 miles north of the boundary, and 416 miles due west of Red River It was found, from its position and natural advantages of wood, water, and good pasture, to be admirably suited for a depôt-site, from which the Boundary Commission parties could complete the marking of the boundary-line to the Rocky Mountains in another season

By previous agreement, surveying operations were suspended on the 8th of October, on the completion of 400 miles of boundary, and the working parties retreated to Red River for the winter.

The latter part of the autumn season had not passed without one or two incidents worthy of record The heat of the sun and the excessive drought during the summer had completely parched the prairie-grass, and the soil was fissured in all directions by the heat. Although the greatest vigilance was practised, the occurrence of prairie-fires was inevitable, and towards the end of August a pillar of smoke, visible to the north at a great distance, gave the warning that before many days were past, the whole of the Great Plains would be swept by fire The course of the fire was most capricious, and often turned, by a ravine or by a slight change in the wind, into a new course. The advance of the fire was noticed for many days by the gradually-increasing temperature of the air, and soon by the smell of the burning grass The different parties of the British Commission, scattered over 400 miles of longitude, at the same time experienced very varied fortunes in their encounter with the fire A surveying party, working in one of the ravines five or six miles from their camp, found that the fire had swept round behind them and threatened their camp with destruction They had just time to reach their camp, and to tear down tents and plunge everything into an adjoining pool, but some camp-equipage was partially destroyed A commissariat baggage-train, drawn by oxen, was also overtaken by the fire, and, though a burnt patch of ground was prepared, and the oxen released from the waggons and driven to it, the unfortunate animals were too much alarmed to remain quiet, but rushed about wildly in the flames, and were badly singed. At one of the astronomical camps the officer in charge, seeing the onward progress of the fire, employed all the men in camp to meet the fire and save as much as possible by burning a circular strip This was so far successful, that about 400 acres of grass were saved, which were of incalculable value to the transport animals on the return march; but the fire that had been started with this object at last got beyond control, and swept back on their own camp, and nearly destroyed it. The result of the prairie-fires, which raged in different localities in August and September, was that the general appearance of the country was now changed from the universal yellow tint to a dismal black, and the whole surface of the plains was as bare of herbage as the sand on the sea-shore The homeward march was consequently rendered doubly anxious by the want of fodder for the horses and oxen, but by diligent search patches of grass were found in wet places, where the fire could not run, and to such places mowers would be sent with light waggons to cut as much grass as they could find during the day's march, and bring it to the rendez-vous, where camp was pitched for the night

From the experience of the previous year at Red River, the period of the autumnal equinox was looked forward to with some anxiety, and the equinoctial snow-storm of 1873 was unusually severe The operations of the Commission had at that time advanced so far westward into the plains as to be beyond the reach of fuel of any kind, and the line of travel, as well as the camping-grounds, were necessarily in a shelterless country The great snow-storm commenced suddenly on the 23rd of September, and the different working-parties, as well as the commissariat trains on the march at the time, made such shelter for themselves as circumstances would permit By placing the waggons in a horse-shoe form, and by stretching canvas sheets on the interior side, some shelter was afforded to the horses from the driving sleet The light canvas tents formed but a poor protection for the men, and, in the absence of fuel, there was no help for it but for them to crowd together and get under their blankets The storm continued, with scarcely any intermediate lulls, for seven days, during which period the horses grazed very sparingly, for as soon as they were turned out they would all come back to the shelter of the waggons During these seven days of forced inactivity the horses lost flesh sadly, and some became incapacitated from work for the remainder of the season This storm bequeathed to us a substantial legacy of 8 inches of snow, which caused great delay in executing the concluding operations of the season. The half-breed hunters who were in temporary camps, hunting buffalo to the westward of us, were also caught by the storm, and some of them were unable to find their way back to their camp, and were afterwards found frozen under cover of some buffalo-hides which they had stripped from the animals they had just killed

There was nearly a month of fine autumn weather after the equinoctial snow-storm, but the winter set in early, and the Red River was frozen on the 28th of October for the winter, having remained open for navigation for a period of six months

Field operations were suspended during the winter of 1873–4, and early in the spring the whole force of the Commission, with commissariat supplies, marched thirty-two days' journey to the westward, and established the new base at Woody Mountain From this point supplies were sent to the working-parties who were tracing the boundary line through the Bad Lands. For 100 miles the country was most rugged and inhospitable, and the only practicable route for the main line of communications lay 25 miles to the north. The formidable gorge of White Mud River could only be crossed by waggons at a point 16 miles north of the boundary, and this gorge crossed the boundary-line so obliquely, as to measure 7 miles from summit to summit.

At a point 500 miles west of Red River, the boundary-line emerges from the most broken portion of the Bad Lands and enters upon an arid plain of sand, where there is a little soil, scarcely able to nourish a light sod, but a cactus-plant flourished in great abundance The buffalo were first met with here in great herds, and the waggon trains were occasionally placed in great jeopardy by the onslaught of these animals travelling northward For about 100 miles of longitude the plain was swarming with countless numbers of buffalo, and as they travelled, the scant vegetation was everywhere nibbled close, so that our own horses and oxen fared very badly Some fresh-water lakes, surrounded by an abundance of fine hay-grass, were found on the boundary-line in the heart of the buffalo country, and at this remote spot were encamped, during the months of June and July, 150 families of half-breed hunters, cut off entirely from the civilised world, and depending for food on buffalo-meat They were assembled and organised as one community for mutual protection Their home-made carts were arranged in a circular form and packed closely together, forming an enclosure 150 yards in diameter, into which their ponies were driven at night and guarded Around and outside the circle of carts the skin-covered tents or wigwams were pitched, where each family had its home and lived separately Great order and regularity prevailed in the camp, principally due to the influence of a French priest who lived with them, and seemed to be their chief adviser Business was transacted by a council, who met daily and decided where they should hunt On a hunting-day the women and children, driving the pony-carts, would follow in rear of the hunters Each hunter would probably kill six or eight animals in the course of half-an-hour's run, and the whole family would be then employed for the rest of the day cutting off the meat—the best pieces only being taken. The well-known pemmican is prepared on these occasions by pounding the meat, pouring over it the melted fat of the animal, and then packing the meat in buffalo-skin bags of about 70 lbs in weight when full. The half-breeds are in constant collision with the Indians during the hunting season.

The arid cactus plain extends for 50 miles from east to west, and is bounded on the west by the remarkable gorge of the Milk River, which crosses the boundary line very obliquely This gorge was explored for 40 miles of its course before a crossing-place for waggons could be found, the banks of the valleys being in most places nearly perpendicular, and 300 feet in height The river itself is very insignificant, and at the fording-place, where the current was running rapidly on the 10th July, the stream had completely disappeared in the sand a fortnight later, and the water had shrunk into brackish pools *

On the arid plateau, stretching for 25 miles to the westward beyond the Milk River, some sage-bushes grow, and both rattlesnakes and the large prairie-fowl or wild turkeys abound, this district being of a similar character to the great plain of the Columbia on the west of the Rocky Mountains

We are now approaching the Three Buttes, or Sweet Grass Hills, the most prominent feature of the western plains, and first visible from a point on the boundary 100 miles distant to the eastward From this point of view the conical summits of the Buttes stand out mistily against the sky-line when viewed in the early morning, but are quite lost in the haze of the afternoon sun. At the foot of these hills their influence is very noticeable in the growth of more luxuriant herbage, refreshed by the rainfall which occurred daily among the hills while no rain fell on the surrounding plain.

On passing round the northern slope of the eastern Butte, the summit of which is 6 miles south of the line, the plain was much broken and intersected by ravines and ridges, and for 25 miles the reconnaissance party had some difficulty in finding a practicable route to the westward for the heavy waggon-trains After crossing much broken ground, an excellent site for a principal depôt was found a little north of the boundary line, on a small stream running northwards from the western Butte

A few days' detention at this depôt-site afforded opportunities for an examination being made of the Three Buttes, and Mr Dawson, the geologist, ascertained that they are of igneous origin. They form a little mountain region of themselves, the highest peaks being 6800 feet above the sea, and from the heart of the Buttes precipitous well-wooded valleys open out, in which there is an abundance of springs, which issue for some distance out on the plain, and are then rapidly absorbed In the recesses of the mountain horned sheep were found, and the buffalo were attracted in vast numbers to the luxuriant pasture-grounds on the hill-sides

The deadly combats that have occurred between the Blackfoot and Crow Indians, when meeting in this region in pursuit of the buffalo, have, in some degree, made it a neutral ground But a recent battle must have been fought, as the bodies of twenty Crow Indians were found on the plain a few miles north of the depôt camp They were all scalped, and the bodies were completely sun-dried and well-preserved by the intense dryness of the atmosphere. From the hill-sides of the western Butte the Rocky Mountains are in full view, and the mountain-peaks in a rugged and snowy outline stand out in full relief against the western sky-line Any one ascending the northern slope of the western Butte comes to the boundary line at the same spot where the first view is obtained of the Rocky Mountain peaks, and by this circumstance the locality of the boundary line in this district is identified in a very remarkable manner

The country to the westward of the Buttes consists of a gravelly undulating plain, in which the water-parting occurs between the northern and southern systems of waters At St Mary's River we came upon a mountain stream flowing northward boisterously in a channel full of boulders and shingle. No sight could be more welcome than those clear and sparkling waters from the mountains after two years' experience of the stagnant pools and muddy rivers of the Great Plains Some coal was found exposed in the banks of St Mary's River, and on the adjacent plateau there were granite boulders, which must have travelled 700 miles from the nearest bed rock

After crossing St Mary's River the boundary line enters the Fertile Belt, which extends for 25 miles to the base of the Rocky Mountains. A great change for the better is now observable in the soil, which is very undulating, and even hilly, before arriving at the actual base of the mountains A thick vegetable soil supplies a rich growth of grass and groves of poplar are found, the growth of which is checked by the fires which sweep through the country. Although the general level of the ground is 4000 feet above the sea, the same plants that were noticeable in the Red River Valley reappear here, having been wanting in the intermediate country, while birch and coniferous trees are found in sheltered localities. The evidence points to the conclusion that the climate is much milder here than in the Red River Valley and the actual experience of the American settlers further south along the mountain slopes is that this fertile strip of country is well suited for the growth of cereals, and cattle can winter out A herd of wild cattle that had escaped from the American settlements on the Missouri was found near the boundary They had supported themselves during the winter and were found in good condition, though many of them were found to have the tips of their ears frozen Many of them were Texas cattle, and were branded so extensively by their successive owners, that the hind-quarters presented a picture not unlike the map of Europe.

The barrier of the Rocky Mountains rises abruptly from the Plain to precipitous peaks 10,000 feet above the sea The horizontal strata of the plains are suddenly broken by the crumpled rocks of the mountains elevated by some great convulsion of nature to the altitude of 5000 feet above the plain, the limestone beds on the peaks and ridges weathering into the most bold and rugged outline, while underneath are the sandstone beds of variegated colours In a cleft in the heart of the mountains Waterton or Chief Mountain Lake is enclosed, and by rafting on this lake access is obtained to the boundary line The lake opens out northward to the plain, and at its northern extremity is the western limit to which wheeled vehicles can be taken There is now no impediment whatever to driving a waggon from Red River due west across the plains for 800 miles to the foot of the Rocky Mountains

For the concluding operations of the Commission in the mountain ravines a train of pack animals was organised and the old trail of the Kootenay Indians was followed across the mountains over a pass 6700 feet above the sea, into British Columbia, and the work of the present Commission was connected with the terminal monument constructed by the former Boundary Commission on the summit of the Rocky Mountains, in 1861, being the eastern limit to which the boundary operations from the Pacific side had been carried at that time

From the mountain summit the view embraces a sea of peaks and ridges of the boldest outlines, and between these knife-like ridges occur amphitheatres with precipitous sides 3000 to 4000 feet deep, enclosing at the bottom a placid lake, in which the waters from their great depth, appear of deep blue colour. Looking eastward may be seen glimpses of the treeless plain, which extends for 800 miles, and looking westward there is a confused mass of rugged peaks and ridges and pine-clad valleys, which extend in almost an unbroken series for 400 miles to the Pacific Coast.

The whole of the operations were carried on through the heart of the Indian country, but the British parties, who were always on the alert for attack, were not molested by the Indians. The British Commission had no other escort except the forty-four Royal Engineers, who were all employed on special duties, but, by their presence and example, good order and discipline were infused among the hired men of the Commission. The United States Commission had an escort of 500 soldiers

The whole boundary from the Lake of the Woods to the Rocky Mountains is now marked by stone cairns or earthen mounds at 3 mile intervals across the great plains, and by iron pillars at mile intervals for 135 miles, marking the southern boundary of Manitoba

As this province is destined before many years have passed to be the great granary of the Dominion, and from its enormous agricultural capabilities, much of its produce will, in course of time, come to Great Britain, a few concluding remarks concerning the present condition of Manitoba may be of interest.

The soil of Manitoba is mostly prairie covered with grass, particularly favourable for stock raising The soil is a deep alluvial deposit of unsurpassed richness It produces bountiful crops of cereals, roots and vegetables. The soil is so inexhaustible that in some places the old settlers have raised a crop of wheat off the same plot of ground for forty successive years

The climate of Manitoba is one of great extremes, and the changes of the seasons are very sudden. In the course of the six months' winter, the soil was found to be frozen to a depth of 6 feet, but the snow does not accumulate in the prairies to a greater depth than 2 feet. The snow goes away very rapidly and ploughing begins at the end of April. Crops are often harvested in ninety days from the time of sowing This is due to the great heat of the long sunny days

The drawbacks to the country are- -

1st The want of markets

2nd Ravages of grasshoppers

3rd. The scarcity of fuel

The want of markets is already in course of removal, as it is expected that in the course of a few months railway communication will be completed northward from Minnesota to Fort Garry This will bring the capital of the new province within fifteen days of Liverpool by a route available all the year round The Canada Pacific Railroad is also in active progress and the new province will eventually have two competing lines of railroad for conveying their produce to the sea-board

The plague of locusts is a most serious drawback, and the ravages of this insect have been widespread over the colony for the past four years. We read, however, that there was no invasion of this pest for thirty-six years, from 1820 to 1857, and as the locusts of last summer left no eggs in the soil, the settlers are not disheartened, and an increased area of land is to be placed under cultivation this spring

Nothing impresses the mind more strongly than the treelessness of the prairies of the north-west, and without fuel the settlement of these districts can never be successfully accomplished Much may be done to encourage tree-culture as in the state of Minnesota, the growth of the poplar and cottonwood-trees being marvellously rapid, the timber now in existence may be economised, and prairie-fires prevented

The wave of emigration has set in steadily during the past four years Four thousand Mennonites from Odessa have migrated to Manitoba, and many families are already established on the open prairie along the British side of the boundary They find water readily by digging 18 to 25 feet, and the scarcity of fuel is thought nothing of, as they are accustomed to use bundles of straw for this purpose A colony of 300 Icelanders has also settled in the province along the western shore of Lake Winnipeg, and are well satisfied with their new home

The settlements to the west are increasing rapidly along the projected line of railroad A steamer has recently ascended the Sascatchewan River to Fort Edmonton, and the line of telegraph will be completed to that point in the course of a few months The surveying parties from opposite sides are working towards each other in the Rocky Mountains for the Canada Pacific Railroad route The Government have recently paved the way for settlers by appointing magistrates to different points throughout the new territory to the Rocky Mountains, and the civil authority is maintained by a force of 300 mounted police, under Captain French, of the Royal Artillery, who has already established the most friendly relations with the Indians throughout the country

The Canada Pacific Railroad will pass through a fertile belt of country, the greater part of which will, in course of time, be occupied by an industrious, though scattered population The snowfall along the line of route is less than at Red River, and much less than in the eastern parts of Canada, and one great drawback to this part of the country, namely, the want of wood for fuel, will be met by developing the great coal-fields of the Sascatchewan, where bituminous coal abounds

[The above paper will be printed, with a map by the author, in vol xlvi of the 'Journal']

Major D R. **CAMERON**, R A. (Her Majesty's Boundary Commissioner), said, when he arrived at the oasis referred to by Captain Anderson, he found only one man there belonging to the settlement, who wanted an account to be paid for some stores that had been supplied to the British party as they were on their way out The fact was that the buildings erected by the half-breeds were simply used as hunting-lodges when they were hunting the buffaloes At other times the houses were entirely deserted. Captain Anderson had spoken of Winnipeg, the capital of the Province of Manitoba The fact was there was no other town in Manitoba · that was the capital of it, and was growing very rapidly In 1869, when he first went out there, between St Cloud and Winnipeg there was no settlement of any kind, but now a branch of the North Pacific Railway ran to the Red River, and the railway was actually graded to within a few miles of the boundary line on the eastern side, but on account of financial difficulties it had not been completed In Canada there was considerable political feeling against anything that came from the other side of the line Canadians objected to connecting themselves with the United States even when such objection was contrary to their own interests They might in the course of a few weeks have a market for their produce if they chose to utilise the line from the United States, but they would not have it, and when they got money enough they were going to run a line for themselves from Lake Superior right across the continent Another subject of extreme interest was the treatment of the Indians In the United States there was nearly constant war along the whole of the frontier from the Gulf of Mexico to the British territory, and an unfair comparison had sometimes been drawn between the government of the Hudson's Bay Company and that of the United States The two, however, were on entirely different footings. The Hudson's Bay Company had had to trade with the Indians, and to say to them, "Sell me those furs, and I will give you these goods," but the United States had had to say, "Turn out, and let me have this land" That was what the Canadians were going to do at the present time, and it was entire nonsense to hope to govern the Indians if the present system was continued He had read the treaties that had been made with the Indians for the Canadian Government they were very liberal, considering that there were only four millions of inhabitants in Canada, but it was absurd to suppose that they would be able to govern the Indians and keep peace as the Hudson's Bay Company had done. Even the Hudson's Bay Company tried to establish a post at Chesterfield House, in the Blackfoot country, and put a hundred armed men there, but were unable to retain the place It had been remarked by the author of the 'Great Divide' that there were three points to be attended to in dealing with the Indians they should be liberally dealt with in making terms, whisky should not be introduced into the country, and white men must be strict and just Whisky was at the present time strictly prohibited The Canadian Government had shown considerable liberality, but as long as they had prairie Indians to deal with, strictness and justice could not be carried out. It was impossible to trace the Indians into the fastnesses of the mountains and prairie ravines in order to punish them He maintained that the only way of dealing with them was by means of education, and that could only be secured by taking their children He would arrange to do it peacefully if possible, but otherwise do it other ways. There were occasions when the Indians would only be too glad to give up their children. In front of Fort Good Hope, in 1840, the keeper saw mothers eating their own children, and when it came to that he thought it was quite possible to arrange to take their children from them. The hunters on the oasis which had been referred to, hired Indian children to herd their cattle, and in that way opportunities offered themselves of obtaining the children and placing them under control, so that they might be educated. The measures which had been adopted in

Canada were exactly similar to those which had been followed in the United States, and the only reason why difficulties had not yet been experienced in British territory was that the Canadians were a step behind the others in moving westward. It was to be remembered that Yankees traded with Indians almost as freely as did the Hudson's Bay Company. He was quite sure that if the policy of the United States was carried out to the north of the boundary the same result would follow as on the south, and collisions would be sure to occur

Mr DANBY SEYMOUR had visited the country in 1859, and went to hunt buffalo in the Turtle Mountain In no other part of the world had he ever seen a region which made so deep an impression upon him as Fort Garry and the Red River Settlement He was there before the large influx of settlers took place, and the principal inhabitants then were the original settlers that went out in the time of Lord Selkirk, and were expatriated from the estates of the Duchess of Sutherland These old settlers were now obliged to take precaution against the emigrants who were continually passing by the Saskachewan to the Pacific lands. He could quite bear out the statement of the author of the Paper as to the rich character of the soil The climate, of course, was extremely severe, and he doubted whether wheat could ever be cultivated with much advantage there Towards the British territory and near the Turtle Mountain the soil was extremely bad, and he thought it could never pay for cultivation That bad soil extended, he believed, right down to the Missouri, and he inferred from that that emigration would not go on at the pace which had formerly prevailed towards the west There was a rich country on the Pacific side and a rich country on the side of Minnesota, but intermediate and extending many hundred miles there was a large rainless, barren tract When he visited the country he came upon the buffalo near the Turtle Mountain Unfortunately he was just a week too late for the grand *chasse*, carried on by the half-breeds who had their camp there, but he learnt from them that the buffaloes had been in such countless hordes that 540 riders had killed more than 1600 buffaloes in a quarter of an hour. He was also told of one spot where about 10,000 buffaloes were trampled to death by others in endeavouring to pass through a ford of the river They had been so tremendously hunted that now they had retired further west He thought that the province of Manitoba would always be more closely connected with the colonies of the Pacific coast than with Canada, because of the vast inhospitable region between Lake Superior and the Lake of the Woods The Lake of the Woods district was composed of morasses with vast granite boulders, and he did not suppose it could ever become a richly-cultivated country. The difficulties of making a railway through it would be very great indeed. Minnesota, however, was a magnificent country, with lakes and woods something like a splendid English park. He had passed through it both in the summer and in January. In the winter journey he had travelled with dog-trains, the thermometer being from 30° to 35° below zero The party were obliged to sleep in the open air, because if they put up their tents in the evening they would become so frozen that they could not get them down again in the morning. The half-breeds of the Red River were a most splendid set of fellows, and he had never seen a finer cross than between Scotchmen and Indians. The French half-breeds, too, were capable of extraordinary endurance, and he augured better for the future of the Indian race than Major Cameron. In no part of the world had the British race mixed more with the Indian race than in the northern part of America, and at the present time such admixture was not considered any degradation, so that he hoped the weaker race would not have such a sad fate as they had had in many other parts of the world. He was glad to hear of the prosperity of the country, and felt sure that with such a good foundation of colonists it would eventually become one of the glories of the British empire.

Major **BUTLER** said that the limits of the Fertile Belt had been set very far too much to the south, and that a considerable extent of very valuable land would be found much farther to the north than was generally believed. His own experience convinced him that beyond what was generally called the Forest Region the plain of the Peace River, which at present was hardly known, was perhaps even more fertile than was the Fertile Belt of the Saskachewan Whether that region was suitable for settlers or not was altogether a question of climate and not of soil, for it had everything that could commend it to the settler as far as soil was concerned He anticipated that when the settlers reached that region it would also be found to have every element suitable for settlers so far as climate was concerned He did not think that Canada had anything to learn from the United States Government as to the proper way of dealing with the Indians It was true that the Hudson's Bay Company were in the position of traders primarily, but they had also been governors over an immense extent of territory, and had never come to grief with the Indians At Chesterfield they pushed an advanced party into the prairies and occupied a post with 100 men, but could not retain it, but at that time the conditions of life on the prairies were very different to what they were at the present time The Blackfeet that surrounded the post did not know what white men were, and the post had consequently finally to be abandoned The Hudson's Bay Company, however, during a long series of years, had managed their affairs with the Indians without any hostility, and had manifested the strictest justice to them, which had enabled them to carry on the greatest trade that had ever been known between a civilised and a savage people, in a manner which must always redound to their credit He thought that if the Canadians carefully watched the dealings of the United States with the Indians and carefully avoided whatever the United States had done, they would get on very well He did not apprehend that they would ever come into contact with the Red men, if their legislation and management were grounded on right, force, and justice They must have force, for a Red man was like a child with the vices of a man, and must be shown that there was sufficient force to rule him. When he was convinced of that he would behave very well

Dr **HECTOR**, many years ago, had had the honour of addressing the Society on the subject of the same country which had been described in Captain Anderson's Paper, and he was able to speak to the accuracy of many of the descriptions that Captain Anderson had given The work in which he himself had been engaged extended from the boundary to a very considerable distance northward He visited the boundary-line on several occasions, and had been at Pembina Mountain and Turtle Mountain. He also made an excursion down close to the Missouri, and in passing saw Les Roches Percées. He found, as Major Cameron had said, that Woody Mountain was not a regular settlement, but a mere hunting-camp, occasionally used when the buffalo retreated to that part of the prairies He likewise visited a point close to the Milk River, called the Cyprés Mountains, some little distance to the north of the boundary, and close to the northern confines of the Mauvaises Terres The other members of the expedition visited the boundary-line close to the Rocky Mountains From all that he learned he was able completely to speak to the strict accuracy and faithfulness of the descriptions which had been given by Captain Anderson. The district of country that had been traversed by the Commission was perhaps one of the most interesting for such a purpose that could be found in any part of the globe More than any other unexplored, uninhabited country, it deserved an accurate survey that would distinguish in detail all the different points, and especially give the relative levels Such information would be of the greatest possible value to science, for it so happened that the boundary-line traversed one of the most remarkable regions on the surface of the globe. The great North-American continent was a triangular patch contained between three great ranges of mountains—the Laurentide Mountains, from the Arctic regions down to Labrador and Canada, the Alleghany Mountains, at a considerable angle to the south-west, and the Rocky Mountains north and south. It was an extraordinary thing that this triangular area contained no hard rocks, but was occupied by soft unconsolidated strata that extended back in geological time to a very high antiquity, and still maintained a thoroughly undisturbed, unaltered character Along the Laurentides the limestone prevailed, which gave rise to the very fertile character of the soil around the Red River settlements, and these limestones were horizontal, though they belonged to the Upper Silurian Period long back in Palæozoic geology These soft rocks, although perfectly undisturbed, were equivalent in age to rocks that formed the principal mountain ranges in other parts of the world They formed the great transverse Divide of the continent between the waters that flow towards Behring Straits and the Hudson's Bay territory, and the waters that flow to the Gulf of Mexico by the Mississippi and Missouri This Divide had been left entirely by river denudation, and extended back to the middle of the Cretaceous Period, and in the Esturine beds that formed the uppermost level of the great unconsolidated barrier close to the Rocky Mountains, at the Three Buttes, the remains had been discovered of reptilian and other animals that were now totally extinct upon the American continent In the Bad Lands, which belonged to a slightly later period, there was a wonderful development of the pachyderms—animals allied to the rhinoceros, hippopotamus, and some forms even assimilating to that of the elephant These inhabited fresh-water beds that succeeded the first emergence of the lands from the sea The soft, unconsolidated rocks had been lifted up to an average of 4000 feet above the sea-level, without undergoing any disturbance whatever, and quite apart from any marks of volcanic agency on such plications of strata as were usually considered necessary to the formation of a great mountain range. The very same strata constituting this ridge were also found close to the sea along the Pacific coast, where they were very much disturbed and altered and thrown into bold plications, so that the more ordinary operations that gave rise to mountain-chains had been at work at that distant period The Bad Lands formed nearly the southern termination of a great ridge of sand, clay, and boulders, that swept round to the north-west at a definite level until it was lost towards the region of the Athabasca It maintained a tolerably uniform level of about 1000 feet above the sea, and the nature of the material left no doubt whatever that it had been associated with a period of extreme cold It had generally been described as the boulder-drift of that part of the American continent It was a remarkable thing that the outline of that boulder-drift which abutted against the Great Coteau, corresponded with the present isothermals across the continent, which also conformed in a general way with the present outline of the Hudson's Bay territory As was pointed out by Dr Rae many years ago, that the arrangement of the boulder, sand, and drift along the basis of the Grand Coteau, which crossed the Saskatchewan above Carlton and came down to the little Souris River, recalled the character of the drift formed at the present day by the packing up of the ice on the shores of Hudson's Bay. To account for this great sweep of drift no great change of seasons, or in the condition of the globe generally, or even in that particular part of the globe, was required · all that was necessary was to sink the ridge of granite-flanked limestone so as to cause an extension of the area now occupied by Hudson's Bay, with similar conditions, down to the latitude of the drift, and then they would have a glacial period in that part of America From the study of this region, therefore, great and important lessons were to be learnt, and he was very glad indeed that circumstances had led to a more exact survey of it than had previously taken place

Dr **Rae** said the Hudson's Bay Company could not be considered as governing the Indians on the outside of their frontier, but beyond the Saskatchewan, to the northward, where there were territories three or four times the size of Britain, the Hudson's Bay Company did govern, not by violence, but by firmness and kindness Not a drop of wine or spirits was allowed to be taken there either for the officers or Indians, and the consequence was that the Indians felt the Company was working for their good, and could be thoroughly trusted. The natives were supplied gratuitously with food when, from sickness or other causes, they were in want Boats and canoes, manned entirely by Indians, would bring cargoes safely into the different posts. These posts were generally several hundred miles apart, and such confidence had the Indians in the Hudson's Bay Company that if a traveller met an Indian and wanted provisions, it was only necessary to give him something with a mark on it, which, of course, he could not understand, telling him to go with it to the nearest trading-post, and he would take it as readily in payment as English people would sovereigns When an Indian behaved badly they invariably punished him, not severely, however, for it was quite necessary to convince them that courage, if not power, was on the side of the white man When once they had learned that lesson, there was never any more trouble with them He (Dr Rae) being a "medicine man," never had occasion to chastise an Indian

Lord **SOUTHESK** said he could bear testimony to the noble dealings of the Hudson's Bay Company with the Indians under their rule He had travelled for many months in the Company's territories, and met with great hospitality at many of their posts, so that he had intimate opportunities of observing their dealings with the Indians With regard to the capabilities of the Indians for education, there was a great difference between different tribes, owing partly to the influence that had been brought to bear upon them He had met with some who were extremely civilised and excellent Christian men, living in the most remote part of the Rocky Mountains, men that might be trusted with anything On the other hand, he had had experience of Indians who were thoroughly untrustworthy. No general rules could be laid down for future dealings of the settlers with them, and collisions might occur as the country became more settled He thoroughly agreed, however, with Major Cameron that the only way to educate them was to get at their children He had frequently been told that the old Indians were not amenable to education, but the young Indians, if taken early, could be trained to something good It was his fortune to see the first steamer that ever sailed on the Red River He was at Fort Garry at the time it arrived, and noticed the wondering looks of the Indians, who crowded on the banks to see the novel object While there, a few months afterwards, the first newspaper printed in the colony, 'The Nor'-Wester,' came out

Major **CAMERON** was afraid that some misconception prevailed with regard to his views He attributed nothing wrong to the Hudson Bay Company He said that they were merely traders, good and successful traders, and they did not injure the Indians Although they made their own profits, they were also profitable to the Indians

The **PRESIDENT** wished to draw the attention of the meeting to the fact that the survey in which Captain Anderson had been engaged, over nearly 1000 miles of territory, had not been a mere labour of love, or even an exclusively scientific operation, but a great political arrangement Defining a boundary between two great empires, like those of England and America, was a great step forward in the cause of civilisation. It was necessary to preserve definite relations, both of territory and policy, between two conterminous powers, before trade could be developed and civilisation prosper Now that there were a definite line and definite pacific relations between the two countries, he trusted that trade would be developed and the resources of the country brought to market. It would have been interesting if they could have heard something on the subject of the great line of railway that was to connect the Atlantic with the Pacific—the Canadian Pacific line. That certainly was a very interesting subject, because upon the completion of that line would undoubtedly depend very much of the future of the countries to which the Paper of the evening referred He understood that at present the operations were suspended

Major CAMERON.—They are certainly interrupted

The PRESIDENT —But in the natural course of events sooner or later they must be resumed, and at no very distant date, in all probability, there would be a complete line connecting the Atlantic with the Pacific, north of the boundary-line As far as geography was concerned, it must be remembered that where a line such as the boundary-line had been once surveyed and definitely laid down, there was a direct basis for all future scientific operation Surveys, using that line as their base, could be extended on either side until the whole country was as thoroughly surveyed as the regions of Europe Of course, the line that had already been run through the country did not aspire to trigonometrical accuracy, but it served, at any rate, as a good practical line for future scientific operations. In conclusion, the President drew the attention of the meeting to the admirable pictorial illustrations of the region exhibited on that occasion which had been furnished by Captain Anderson

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Tenth Meeting, Tuesday, 11*th April*, 1876

HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH, HONORARY PRESIDENT, in the Chair.

ELECTIONS —*Abraham Gould, Esq* , *R Robinson Hazard, Esq* , *Thomas Livingstone-Learmonth, Esq* , *Captain Charles B Norman* (Bengal Staff-Corps), *Robert Henry Charles Pallett, Esq* , *Captain Richard Robert Patterson; Captain W. F. Segrave* (H M. Consul, Stockholm)

DONATIONS TO THE LIBRARY, FROM 27TH MARCH TO 10TH APRIL, 1876 —La vida y los trabajos industriales de W. Wheelwright, por J B Alberdi, 1876 (*Author*) Notes illustrating charts of the Cross and Old Calabar rivers, &c, by J. B Walker, 1872 and 1876 (*The Rev. Dr. H MacGill*) Bulletin of the U. S Geological and Geographical Survey of the Territories, No 2 (*Dr F. V. Hayden*). Ueber den Einfluss des Freiherrn Justus von Liebig auf die Entwicklung der reinen Chemie, von E. Erlenmeyer, 1874, and Ueber die Beziehungen der Chemie zur Rechtspflege, 1875 (*Royal Bavarian Academy of Sciences*) Décret de S M. le Roi de Portugal ordonnant la Création d'un Comité central permanent de Géographie, 1876 (*Don José Julio Rodrigues*). Abstract of the Reports of the Surveys and other Geographical operations in India for 1873–74 (*H.M Secretary of State for India*) The Edda Songs and Sagas of Iceland, by G Browning, 1876 (*Author*) On the Physical Geography of part of the Atlantic between 20° N. and 10° S., by Captain H. Toynbee, 1876 (*The Meteorological Committee*). Narrative of a 40 days' sojourn in the Holy Land, by Sir Moses Montefiore, 1875 (*Sir M. Montefiore*). Relazioni sulla revisione dell' Estimo rustico nelle provincie di Camerino y Perugia e la Sezione delle Marche, di L. Vannicelli Casoni, 1847 and 1848 (*J. Murray, Esq.*). Palestine Exploration Fund Prospectus, Preliminary Report, Catalogue, and Nos. i., ii., iii., and vii. of Quarterly Statement, towards completion of series (*Major Wilson*, R.E.). And the current issue of publications of corresponding Societies, &c.

DONATIONS TO THE MAP-ROOM FROM 27TH MARCH TO 10TH APRIL, 1876.—Map of Algeria, map of Congo, Angola, and Benguela, 1823, map of United States, 1814 (*S. M. Drach, Esq.*). Map of the City of Milan, map of the Environs of Milan (*Antonio Vallardi, Publisher, Milan*).

Owing to the expected great attendance of Fellows and their friends to hear Lieutenant Cameron on his first appearance before the Society after his return from Africa, the usual Evening Meeting of the Society was held to-day in St. James's Hall, instead of the Hall of the University of London, the day being altered from Monday to Tuesday, in consequence of the Hall not being available on the usual night of the Society's Meetings. In opening the business of the evening, His Royal Highness the DUKE OF EDINBURGH spoke as follows:—

LADIES AND GENTLEMEN, I have great pleasure on this the first occasion that I have occupied the Chair since I was honoured by the appointment of Honorary President of the Royal Geographical Society, in having an opportunity of presenting to you so celebrated a member of the profession to which I have the honour to belong—a gentleman who has distinguished himself greatly by the journey which he has accomplished from sea to sea through the centre of Africa. I feel, ladies and gentlemen, that it requires little preface on my part to introduce to you Lieutenant Cameron. The remarks upon this extraordinary journey are to fall from him, and any words by which I might precede them would only defer the pleasure with which you will listen to the account which he will give of his interesting exploit. I must congratulate the Navy upon the fact of its being a member of the naval profession who has, with that pluck and energy which distinguish Englishmen in general, and, I believe, naval officers in particular—succeeded in accomplishing so great a feat—a journey right across the vast continent of Africa, and extending over a period of two years and eight months. Although the original object of his journey was to search for our late lamented explorer Dr. Livingstone, yet it eventually came to be a separate and independent exploration on his own part I have great pleasure in now introducing to you Lieutenant Cameron, and I am sure we shall all be very much interested in the account which he will give us of his interesting journey.

On his Journey across Africa, from Bagamoyo to Benguela

By Lieut V. L CAMERON, R N

Lieut. Cameron read as follows —

IN consequence of the shortness of the time, I can do no more than give a very brief *résumé* of my journey this evening

The first portion of the journey may be considered as that from the East Coast to Ujiji. The Expedition consisted originally of Dr Dillon and myself, at Aden Mr Murphy, of the Royal Artillery, volunteered, and joined us afterwards at Zanzibar, and a day or two before leaving Bagamoyo, Mr Moffat, of Natal, a nephew of Dr Livingstone also joined

My first great difficulty was to provide porters to carry our stores, and after nearly a month at Bagamoyo, I formed a camp at Shamba Gonera to try and keep the men together, but with no good results In the middle of March, 1873, Dillon started to form a camp at Kikoka, the furthest Balooch outpost of his Highness Syed Burgash, and a little beyond the Kingani A few days afterwards Sir Bartle Frere came over to Bagamoyo, bringing Moffat with him Two days afterwards I joined Dillon at Kikoka, leaving Murphy ill with fever under charge of the French Missionaries at Bagamoyo The French Missionaries were most kind and hospitable during our stay, and they are doing a very good and important work in the country They have a large number of pupils, who, besides being Christianised and taught to read and write, are also instructed in the ways and means of earning their livelihood in after life The buildings are erected by the lay brothers, and in the farm and gardens they grow most of the food they require, so that the Mission is almost self-supporting When the pupils grow up to be men and women, they are encouraged to marry amongst themselves, and are kept under supervision, instead of being lost sight of altogether

There was a great deal of opposition amongst the Wamerima, owing to an idea (which pursued us to Unyanyembé) that we were personally engaged in putting down the slave-trade, though the higher-class Arabs were friendly to us.

Moffat accompanied me to Kikoka, and then returned to Bagamoyo to assist Murphy. On the 28th of March, 1873, Dillon and I started from Kikoka, but had to leave many loads behind, owing to the porters having got back into Bagamoyo, notwithstanding my having paid the guard at the Kingani to prevent their crossing From Kikoka, Dillon and I marched to Msuwah, across an almost uninhabited country, with park-like stretches of open grass, clumps of fine trees, and strips of jungle, and here and there intersected by nullahs, which, after heavy showers of rain, became considerable streams

We were detained in one place some days trying to get food, which was very scarce, and the villages lay some way from the road. I went out once to look for it, but, owing to trusting to Bombay, lost the track and had to sleep in a swamp, amid pouring rain, in consequence of which I was laid up with fever until our arrival at Msuwah At Msuwah the country began to rise more decidedly than it had hitherto done There was a good deal of cultivation about, but the villages were in dense clumps of jungle, and very few strangers are allowed to enter them We formed our camp close to the village of the chief, and were initiated into paying tribute, having to give 30 dotis to a smiling old villain.

From Msuwah we travelled on with an Arab caravan till past Simbawéni, crossing the Lugerengeri on our third march, and going through a pass in the Duthumi Hills, and then through a well-cultivated, fertile valley full of small conical knolls, and by another pass on to Simbawéni, and then across the Lugerengeri a second time. From here we followed the same route as Stanley to Rehenneko, on the other side of the Makata The difficulties of this swamp have been much exaggerated, as most of it was fair marching, except in one place, where the mud was deep, and we could not get the donkeys along more than half-a-mile an hour The swamp must generally have been in the same condition as when Stanley crossed it, the bridge, after a night's heavy rain, being out of sight, just as he said it was in his up-journey

At Rehennéko, Dillon and I halted for a month to wait for Moffat and Murphy, at the end of which time Murphy came up alone, bringing the sad news that Moffat had died before crossing the Makata Poor young fellow ! his whole heart was in the Expedition, he had sold his all, a sugar-plantation at Natal, and was willing to expend the last farthing in the cause of African exploration Murphy himself was very ill when he arrived

After a few days' halt to enable him to recover his strength somewhat, we started across the Usagara mountains, and then passing Muinyi Useghara up the valley of the Mukondokwa, by the same route as Stanley, to Lake Ugombo, and then across a rough waterless country to Mpwapwa The part of the Mukondokwa travelled through by Burton has been so admirably and minutely described, that it leaves nothing to be desired. At Mpwapwa were three or four caravans of different sizes, and one of Wanyamwezi would have been robbed if I had not interfered to prevent it. From Mpwapwa we went on across the Marenga Mkali, and to obviate the inconvenience of being without water for two days, I filled four air-pillows with water, which held three gallons each. After the Marenga Mkali we arrived at Mvumé, the first station in Ugogo, came into the full swing of tribute-paying, and were detained three or four days before it could be settled. The first day the chief and all hands were drunk, and next day the chief would only receive the tribute through his prime minister, and he was too drunk to transact any business, and so on from day to day.

There is no passing through Ugogo without paying tribute, for although the people do not as a rule fight, if the demand is resisted they carry off all they can of their provisions and stores, destroy their houses and all they leave behind, fill up their waterholes, and retreat into the jungles, leaving the strangers to die of thirst and starvation, assured of being repaid by the stores which are to be abandoned for any losses they may themselves have incurred This occurred two or three times when Arab caravans have attempted to avoid paying mhongo

Soon after Mvumé we struck Burton's route at Kanyenyé or Great Ugogo, where the same chief (Magomba) reigns as was there in his time. From Kanyenyé we went on rising at the end of the plain which leads up a steep wall-like range of hills to another plateau. On this plateau we went through a range of hills formed of blocks and boulders of granite, piled about in the wildest confusion, and came to Usekhé, where we camped close to the largest boulder of granite that, up to that time, I had ever seen Here again tribute, drunkenness, and delays, and then on our march to Khoko, where some Wamerima are settled, and where we camped under one of three enormous trees—our own caravan and others accompanying it, in all amounting to about 500 men, camping under one tree From here was one march to Mdabaru, the last district of Ugogo, and where we finished with mhongo for the time being. As we were a short way from where white men had passed before, the chief's headman said we had to stop till all the people had seen us, in fact, he made a raree show of us

We now entered on what used to be dreaded as Mgunda Mkali, or fiery field, but which now is far easier to traverse than it was in the days of Burton and Speke Many of the Wakimbu, who have left their former homes, are busy clearing and building

After a few days we came to Jiwé la Singa, where there were almost as many fantastic boulders as near Usekhé, the name of the place meaning the rock of soft grass Here we laid in provisions intended to last us to Unyanyembé From here we marched through a wild and uninhabited country, with much game, but very wild and scared, making longish marches on account of the scarcity and badness of the water.

On the 31st of July, 1873, we reached the village of the chief of Uiguru. Here we stopped one day to buy food, as our provisions were exhausted, and for the first time camped in a village Our tents were crowded all day long by the natives, and at night we found that they had left many small but disagreeable inhabitants behind them

From here to the outlying villages of Unyanyembé was four long marches through uninhabited country At the end of the second we camped at a place called Marwa, where water is only to be obtained by digging at the base of a boulder, and no one is allowed to say maji (the common word for water), to fire a gun, or walk by with sandals or boots, for fear of offending the fiend in charge of the spring, and causing him to stop the supply of water

The next morning, as Dillon and I were out on one side of the track looking for game, we saw a couple of lions about 600 or 700 yards off, trotting quietly home after a night out The same afternoon we heard an alarm of "Ruga, Ruga," or robbers, and going to the front found that a small party had been robbed of some ivory and two women slaves, and had had a man wounded Our men were very frightened, but we managed to get them along, and about 5 P.M. we arrived at a large pond, camped, and fenced ourselves in. In the early part of the night a few arrows were shot into the camp, but we kept watch ourselves, and made our men do likewise, and so the rest of the night passed without further alarms The next day we arrived at the outlying villages of Unyanyembé, and on the 5th of August we marched into Kwikuruh, its capital, and were entertained at breakfast by Said ibn Salim ibn Raschid el Lamki, the Arab governor, and thoroughly did we enjoy our good breakfast after the scanty fare on which we had been living. After breakfast he and many other Arabs escorted us to the house where Stanley had lived, and which was now lent to us by Said ibn Salim After a couple of days we had to pay a round of visits to all the principal Arabs, and eat with all This was a very formidable undertaking, as we had to eat something with each to avoid giving offence, and this lasted from 10 A M. till 4 P M. A day or two afterwards I was knocked over by fever, and Dillon and Murphy soon followed suit. About the 21st of August, 1873, a letter from Sir Samuel Baker arrived in charge of some of King Mtesa's men, and I sent a letter back by them We were delayed by fever, blindness, and other illnesses, till the end of October (and also by desertion of men), when Chuma and another man arrived bringing the news of Dr Livingstone's death, and saying that his caravan was near I instantly sent off a large bale of cloth to assist them When the body of Dr Livingstone arrived, all the principal Arabs assembled at our house to show respect to his memory

A few days afterwards Murphy resigned, and when I was on the point of starting westward, having fitted out Livingstone's men with stores for the coast, Dillon was so ill as to be unable to proceed. He was in great pain, and had lost the sight of one eye by atony of the optic nerve, and was altogether breaking up He wanted to the last to go on, but at the same time the only hope, though a very faint one, was that he might recover if he got to a more temperate climate, and at last he yielded to my earnest representations. After he had decided to return, Murphy volunteered to rejoin the Expedition, but owing to difficulties about stores and porters I thought it best to go on alone Dillon and Murphy, with Dr Livingstone's corpse, left for the coast on the 9th of November, 1873, and the same day I started for Ujiji. I tried to steer straight for Ujiji, but, owing to the fear all my men were in of the ubiquitous Mirambo, and the desertions caused by it, I had to make a considerable détour to the south. A few days after I parted from my two companions I received the sad news of Dillon's death. Poor fellow! he was one of my dearest and oldest friends, and we had been together on the East Coast Clever and good-hearted, and always kind and forbearing with the men and natives, his death was a great grief to me. I reached Ugunda in the beginning of December and there found Murphy, who had lost some of his cloth, and had had to send back to the Arab governor for more. After one day at the capital of Ugunda I went on west, but two marches out was met by a chief who said we could not pass that road until he had settled some row with the Arabs at Unyanyembé, this delayed us till the beginning of January.

On the 5th of January, 1874, we reached the boundaries of Unyamwezi Proper, and then across a large plain, and the S. Ngombe, and came to Ugara, in all three districts of which I had to pay tribute After Ugara I came to mountainous country—Kowendi—and running water, the first which I had seen since leaving

Mpwapwa. The mountains extend to the borders of the Tanganyika; but at Ugaga we came on Burton's route, and thence, passing just to the north of the Malagarazi Valley, we arrived at the Tanganyika by a comparatively easy route Before reaching Ugaga, however, we had a good deal of trouble, as the guides did not know the road, and I was utterly lame from a large abscess on my leg, and therefore unable to take the head of the caravan and direct its course On my first view of the Tanganyika I could scarcely comprehend it. Such was the immensity of the view that I fancied the grey lake to be sky, and the mountains of Ugoma in the distance to be clouds However, it dawned on me by degrees that that was the Lake, and nothing else At Kawélé, the capital of Ujiji, I was well received by the Arabs, and, after securing the books and other things left here by Dr Livingstone, I immediately made preparations, and got away for a cruise round the Lake This cruise may be called the second portion of my journey, but as it has already been discussed from the data afforded by my journal, which I sent home from Ujiji, I need not refer to it in detail any further One of the sketches will give an idea of some of the extraordinary masses of rock on parts of the shore In my cruise I found ninety-six rivers, besides torrents and springs, coming into the Lake in the portion I went round, and *one*, the *Lukuga*, going out This river flows to the Luvwa, and joins it at a short distance below Lake Moero The comparatively sluggish current of the Lukuga is accounted for by the level of the Luvwa on leaving Moero being 3000 feet, and that of the Tanganyika being 2700 therefore the Lukuga falling into the Luvwa follows along nearly a dead level, and also meets the Luvwa at rather an obtuse angle, so that the water is somewhat dammed back by that of the Luvwa At the junction of the Lukuga and the Luvwa is a large island, called Kalongwisi, and of the two branches into which the Lukuga is divided by it, one points rather up, and the other rather down stream

I had some intention of trying to cut a way through the grass, or proceed alongside the Lukuga to the Luvwa, but, on my return to Ujiji, I found that I could not get a single man to follow me, as none of the Arabs there knew the road, and I could not obtain a guide, and none of my men would proceed without one. When at Ujiji I sent down the charts of the Tanganyika and letters to Zanzibar, and also the things I found belonging to Dr. Livingstone, in charge of my servant and two other men. As soon as I could get a few stores I returned to Kasenge, the place where Speke landed on the western bank of the Tanganyika Whilst absent on the Lake I only used for myself and over 40 men, 4½ bags of beads, and a large portion of these were stolen On my return I found to my horror that, instead of having, as I anticipated, about thirty loads, only four were remaining; the rest had been squandered or stolen, and I never could get any account of what had become of them Here, in consequence, I discharged all those men who did not wish to go any farther, and made my way on ahead from Kasengé with seventy, all told, in the caravan

The next portion of the journey to be described is that from Kasengé, by Nyangwé, down to the capital of Urua. After leaving Kasengé we first crossed the southern end of the mountains of Ugoma (although nominally in Uguhha), and many streams flowing south and south-west towards the Lukuga At one place on our road we passed a hot spring, about which the vegetation was very luxuriant. Many frogs and other reptiles were living in it The first country we passed was Uguhha, the people there are distinguished by the peculiar and tasteful manner in which they dress their hair, and the elaborate tattooing on the women's stomachs Their clothing then appeared to me remarkably scanty, but, compared with what I saw farther on, was very ample We then passed through a number of small tribes, which form a sort of dividing line between the great empire of Urua, of which Uguhha is a part, and Manyuéma, where every small village has an independent chief. From Uguhha we crossed the mountains of Bambarré, and on arriving at their foot, came into a completely new style of country The huts were all built in long low streets, and rows of oil-palms were planted down the centre The women did up their hair in the most extraordinary manner. Many of their head-dresses looked like an old-fashioned bonnet with the back out, and long ringlets hanging down their necks The men plastered their hair with clay into cones and patches, so that they looked as if they had some sort of helmet on their heads Between the patches of clay their heads were shaved, leaving the scalp bare. In the gullies of the Bambarré Mountains are some of the most enormous trees that I have ever seen The gullies are in many places from 100 to 150 feet deep. You can look down from the bank and see trees growing from the bottom of the gully, and look up to their heads towering to an equal height above. We had now the full benefit on our marches of the grass of Manyuéma, complained of by Dr. Livingstone This grass grows in places to a height of 12 feet, and the stalks are thicker than one's finger. It is almost absolutely necessary to burn the grass in front of one, in order to be able to get along. The people of Manyuéma are a very fine-looking race, but roughly armed with shields and heavy spears, they have no knowledge of bows and arrows A great deal of iron is worked in the country, and they are very expert smiths. The iron ore is of a black shiny sort. At one village, Karungu, some Arabs with whom we were in company got into trouble with the natives, and had a fight. I told them that if I was attacked I would defend myself, but I refused to allow my men to go out and fight on their side, as I believed these Arabs (or rather Wamerima) were more in the wrong than the natives, and after the engagement I used my influence to effect the release of the slaves taken by the Arabs.

A few days after this we arrived at Kwakasongo, where I found an Arab settlement. I had to stay there nearly a week The chief of this village is called Kasongo, but he must not be confounded with the great Kasongo, chief of all Urua, being, in fact, simply the chief of one village, and by trade a working blacksmith. From Kwakasongo I went by land three marches to Kumbwi, on the Lualaba, and there, after a great deal of trouble, I obtained boats to take me and a few of my men on to Nyangwé by river, leaving the rest to follow the route on shore. At Nyangwé there is a large permanent settlement of Arabs and Wamerima, the houses of the Arabs are on one small eminence, and those of the Wamerima on another. Here the bed of the river has a very rapid fall, and its current is very fast—from 3 to 4 knots opposite Nyangwé. I measured the width of the river at this point with a sextant, and found it to be 1020 yards, in many places it is much wider. The depth opposite Nyangwe towards the end of the dry season is, on an average, over a fathom, with channels of 3 fathoms in depth. The river is full of crocodiles and hippopotami Whilst at Nyangwé no less than three or four slaves were carried off by the crocodiles when going to fetch water at the river If they had not been so lazy, they might have fetched the water from a spring only a very little further off.

After having been detained at Nyangwé about three weeks, a party of Arabs came in from the south side of the river—where they had been fighting with the natives—bringing news that Tipo Tipo was coming up from his camp, in order to make peace between the Arabs at Nyangwé and King Russuna, a friend of his who had been attacked by the Arabs from Nyangwé. Tipo Tipo, whose Arab name is Hamed ibn Hamed, I may say, in passing, is the first Arab who reached the Lomâmi from the south-east. During the whole time I was at Nyangwé I was only able to get one small canoe. Tipo Tipo on his arrival told me that if I would come down with him to his camp, some eight marches south of Nyangwé, I should from there be able to find my way to a great lake, into which the Lualaba fell.

When I reached his camp, I found that the chief on the opposite side of the Lomâmi refused to let me pass, saying that no caravan had ever been through his country, and if anybody tried to pass, he would fight them When at Tipo Tipo's camp I heard of a lake called Iki, which I believe is the Lake Chebungo, or Lincoln, of Livingstone, which is a little to the west of the Lomâmi, and on the Luwembi. I met many people who had been across to the great lake of Sankorra. According to their accounts, this lake was from ten to fifteen days' journey off, the discrepancy in time arising from the different lengths of the day's marches Here I saw cloth and other stores, which had been brought across from the lake by the native traders, who also reported that on this lake there were men who wore trousers and hats, had very large boats, capable of holding from 180 to 200 men, with masts and sails, and on which they had fires for the purpose of cooking their food. These at the time I supposed to be Portuguese Pombeiros from Kassange, or perhaps white Portuguese. On the refusal of the chief to the west of the Lomâmi to allow me to pass, I began to inquire what course I should adopt in order to get to the Great Lake, and was told that if I went down to the capital of Kasongo, I should there find Portuguese traders, in evidence of which I was shown a Portuguese soldier's coat, which had come from near that place, having been brought there by a trader from Bihé. After a few days Tipo Tipo gave me three guides, natives of Urua, to show me the road to Kasongo's capital There is yet another Kasongo, who is chief of the district where Tipo Tipo is settled, and who is comparatively powerful, but at the same time he and nearly all the chiefs to the south of Lualaba pay tribute to the great Kasongo of Urua. Leaving Tipo Tipo's, we went nearly south, going close along the right bank of the Lomâmi At many places the people were very friendly, but in others so many reports had come that no caravans came near there for any other purpose than getting slaves, that the villages were deserted, and we were often in difficulties about food Down to 6° 10′ s. we were constantly crossing small affluents of the Lomâmi, and from time to time having glimpses of the river itself Here we crossed one of two branches into which it splits, forming a sort of island As we were passing through a strip of jungle some people commenced shooting at us, and an arrow glanced off my leather coat. I ran this man down and gave him a thrashing, but would not allow any one to fire in return, and walked straight up to some people who were in front of us, we tried to make a palaver, in which, after a time, we were successful, and we went on with the natives as the best of friends From there we crossed this branch of the Lomâmi, called the Lukazi, again, and passed down south through villages and jungle alternately, till we arrived at a place called Kamwawi Here, on the day we arrived, as I had no faith in my own guides, I engaged others to show us the direct route to Kasongo's capital, and paid them to do it In the afternoon women and children were about our camp selling food, and everybody seemed most friendly Next morning, as we were packing up for the road, I missed my pet goat, Dinah, and asking where she was, I was told that she slept outside the camp I went to look for her, and walked up into the village to ask about her, and so little did I suspect any harm, that I had no gun or pistol with me, and the man who accompanied me was also entirely unarmed When we made inquiries about the goat the natives began shooting at us Some of my men ran up and brought me my rifle and pistol, and the remainder packed up all our stores, and came into the village For a long time I would not allow my people to fire At last, as the natives were closing in, and a large body of from 400 to 500 men came up from the road which we had intended to go, I at last allowed two or three shots to be fired, and I believe one of the natives was then shot through the leg After this we commenced a parley, and it was proposed that my goat should be returned, and that one of my men should make brothers with the chief, and that we should exchange presents and be good friends While that was going on, another large party came in, headed by a chief, who told the people of the village that they should not be such fools as to make peace with us, as we were a very small caravan, and they would be able to kill or make slaves of the whole of us, and share our beads and stores amongst them When they arrived, the people again began shooting at us I would not allow my men to fire, for fear of breaking off the negotiation, until the men closed in, throwing their spears at us I then fired two or three shots close to some of the natives, set fire to one of the huts in the place, and told the chief that if he did not take his men off, I would burn the village down, they had already burned our camp On this he said, that if we left the village we could go unmolested So the guides that I had got from Tipo Tipo said, that if we went off some ten or twelve miles, to another village to the eastward, we should find people that were friendly towards us We marched from ten in the morning until sunset, through thick grass and jungle At every slip of jungle the natives closed in upon us, shooting, and we had two or three men wounded, but it was next to useless returning the fire, as we could not see them, and being short of ammunition, I was afraid of wasting it. At sunset we arrived close to a village called Mkatété (which I afterwards re-named Fort Dinah, in memory of the goat), and I told the guide to say that we wanted to be friends and to camp there, their only answer was a volley of arrows. As we were unable to stop out in the night in the jungle, with all these fellows round us, I called out to my men to follow me and storm the village. Four men followed me, the rest, except one or two men, with Bombay, who was told to look after the stores, ran away. Luckily the natives ran the other way When we got into the village I burned all the huts down but four, and my men coming up, set to work to make a fortification, the four huts formed block-houses at the corners, and the walls were loopholed, and the thatch was torn down for fear of fire. We made a stockade of banana-trees, doors of huts and poles from the walls of those we burnt down, inside we dug a trench, with earth up against the fence, and a bank inside it again. This we roofed over with other doors, so as to protect our heads and backs from the fire of the opposite side Here we remained five days We were being constantly shot at, and some men wounded. We were fortunately close to water and plantations of cassava, so that we were well supplied with food and drink. The guide told me we must shoot some of the natives before we could get out of our prison, and at last I was forced to use my gun The report of my heavy rifle they soon learned to respect. At the end of five days we made peace, they having been cowed by some of their people being killed and wounded We found that some of those who had been attacking us were relations of our own guides, but, notwithstanding this fact, our guides had remained faithful to us the whole time The natives, after the fight was over, offered an indemnity, which, however, I did not accept, but we exchanged presents as a token of friendship Our guides now took us south again, and, after a few days' marches, they heard that the head guide's father, who was a chief, having neglected to pay his tribute to Kasongo, his village had been destroyed Our guide was therefore afraid to go on; but, by dint of lying, he persuaded me to go about twenty or thirty miles more to the east; all of which distance I had to tramp back again in order to get to Kasongo's. A few days' journey from Kasongo's capital I met some men belonging to Jumah Merikani, who were out trading for ivory, and looking for food; they gave me a man belonging to Kasongo to show me the road into Jumah Merikani's permanent camp. On my arrival there I found a large camp, and learnt that there was a Portuguese trader near, called Alvez, a native of Dondo, on the Kwanza; but for the last thirty years or so he had been settled at Bihé He told me that in a short time he was going to start for Bihé or Kassangé, towards the West Coast, and offered to show me the road down to either Benguela or Loanda At first he told me that he was going to Kassangé, which was in the direct line for Loanda, but this was only one of the numerous falsehoods he used to invent As he said he was not going for some little time, I first set off north for a few days to see Lake Mohrya, which is interesting, as on this lake there are villages with huts built on piles, resembling the lake-villages which have been lately discovered in the Swiss lakes On my return to Kilemba, as Jumah called this camp, I heard that Kasongo was still away, and, after wasting some days trying to get guides from his wife, Fumé a Kenna, to take me down to a large lake that I heard of in the course of the Lualaba, I set off without any, and on arriving at Kowedi, six or seven 'hours' march from the Lake, I found my passage barred by a chief, who said he had orders to allow no one to pass the Lovoi, which was between us and the Lake, as a brother of Kasongo, called Daiyi, who was up in arms against him, was living with a chief there, but that Kasongo was near, and if I sent to him I should, perhaps, be able to get leave However, I was able to send men across to the Lake, and they brought back news that the Lake was very large, but very much encumbered with floating vegetation, on which the people laid trees, and on them again spread earth and built their huts, and grew provisions on these floating islands, which they cut adrift from the main mass, and at times they used to shift about from one portion of the Lake to another. This Lake Kassali, or Kikonja, was also remarkably full of fish, and I believe one of the reasons why I was not allowed to go there, in addition to the orders of Kasongo, was, that the fetish-men of the chief said that if I saw the Lake it would dry up, and that they would lose all the fish on which they, in a great measure, depended for their sustenance.

The men I sent to Kasongo could not find him, and therefore I had to be content with a distant view of the Lake I then sent back to Kilemba to try and get a guide from Fumé a Kenna, but as none appeared after a delay of over three weeks, and I being ill with dysentery, I determined to return to Jumah Merikani's The day I got into Kilemba I met the guide coming out, having evidently been sent on the news of my return. I heard also that Kasongo himself intended returning into his own compound, which was between the Arab and Portuguese camps; that he would be there in a few days, and during my absence he had been there, and expressed great disappointment at not seeing me, and had said that if I came back again I was not to be allowed to go away until he returned. I went over to see Alvez, and asked him when he would be ready to start. "Oh," said he, "directly Kasongo comes in I have already packed my ivory, two or three days to say good-bye, and then I am off I shall not stop anywhere on the road, perhaps we shall stop three or four days in all to buy provisions, but we shall reach Bihé in fifty or sixty days" This was the end of December It was nearly six weeks before Kasongo came, and then we were delayed, first to see a great levée of the chiefs round him, and afterwards by the death of one of his sisters, and various other excuses, till one day I heard that Alvez had promised to build a house for him at a new settlement, which he was going to form I went over to protest against this, and at first was told it was untrue. Afterwards he said, "Oh, the house will only take four days to build" I went some days afterwards, and was told that Alvez' head-man had gone to build the house, and I should not have to wait at all However, it was February, 1875, before we made any move, and then when we came to the place where the house was to be built, there was not a sign of it We were twenty days building the house, and my men had to do the principal part of the work, and I had to superintend almost the whole, and lay it out Soon after the house was commenced, I heard that Alvez had men at a place called Kanyoka, some little distance off, on the boundary between the dominion of Mata Yanvo and Kasongo These people had not been heard of for upwards of a year, and Alvez said he must get news from them before he could proceed to the coast On account of all these numerous delays, I tried to get men to proceed overland to Sankorra, but was unable, then I asked Kasongo to give me boats or canoes, of any sort, to go down the Lomâmi again, and so get back to the Congo by that river In reply he said that I had too small a caravan to travel by myself, and as he could not guarantee my safety alone, he would not allow me to travel except with Alvez' caravan, unless I went back and stopped with Jumah Merikani, so I had the choice of going on with Alvez or returning to Jumah, and perhaps waiting in Kasongo's country for over a year without the means of getting away.

The Kanyoka people returned in the middle of May, and in the mean time Alvez had left Kwarumba, a son of Major Coimbra, of Bihé, to go away on an expedition in search of slaves. A few days after the arrival of the Kanyoka party, ultimately we were enabled to start for Lunga Mandi's, ten days' march south and by west of us. In the mean time, through the gross folly of one of my men, our camp was burnt down All my portion of it was destroyed, and I had very great trouble in saving my journals and papers. Indeed, if my servant and one or two men had not worked very pluckily the whole must have gone Old Bombay was drunk and foolish at the time, and never turned up until after the fire was over, having lost his rifle and pistol, but having all his clothes saved by some other men A few of the huts belonging to some of Alvez' people were burnt down, and for articles alleged to have been lost, but which, for the most part, had no existence, I had to pay most extravagant prices

The fourth section of the journey was from Kasongo's capital to the West Coast at Benguéla We first crossed the Lovoi, and then nearly along a watershed between rivers running to Lualaba above Kassali, in a south-easterly direction, and those joining the same stream in a lower part of its course, but running nearly north After that we passed nearly along the watershed between the Zambesi and the Congo, until we arrived in the basin of the Kwanza

After crossing the Kwanza and leaving its basin, we passed several independent streams running into the sea between the mouth of the Kwanza and Benguéla

I arrived at Benguéla on the 4th of November I have already said that from where we had built the house for Kasongo we had marched ten days down to Lunga Mandi's He was a sub-chief of Kasongo, but had considerable power Here I was told we should have to stop three or four days in order to buy food, but having been there four days, a small caravan, under the charge of a slave of a Portuguese merchant at Dondo, arrived, and I was told, "Oh, then, you must stop another day for these people to buy food" The next day I asked, "Is everything right as to the road?" and the answer was, "Oh, yes, and we are certain to go," and in the morning, when I was woke up, I was told there would be no march that day Alvez' men refused to leave without their friends, who were away with Kwarumba. I went to Alvez, and said, that when he allowed Kwarumba to go for slaves, he had promised that it should cause no delay in the starting of the caravan; but that if Kwarumba did not return, then we should go on without him Alvez said he was not waiting for him; but was waiting for a man who had not leave to go, who was a very great man among the natives of Reké, of whom the caravan was principally composed At last, by dint of putting the screw on very sharp, we got away after a delay of three weeks. At the first camp we were delayed by people going to look for their runaway slaves. The next morning, when I was ready to start, a message came, "No march, Kwarumba is coming up with his slaves, you must wait that day for him"

Alvez was especially impertinent on this day, and if I had not learned patience pretty well, I believe I should have shaken him out of his rotten old clothes I believe before we left Lunga Mandi's, news had arrived that Kwarumba was on the road, or we should not have got away at all. Kwarumba arrived that afternoon with a string of fifty or sixty wretched women, carrying heavy loads of plunder, and some of them with babies in their arms These women represented as many as forty or fifty villages destroyed and ruined, most of the male inhabitants having been killed, and the rest driven away into the jungle to find what subsistence they could, or die of starvation I have no doubt that these fifty or sixty slaves represented upwards of 500 people, either killed in defending their homes or who had died of starvation afterwards, besides a much larger number rendered homeless All these women were tied together round their waists with thick knotted ropes, and if they lagged on the march, were most unmercifully beaten The Portuguese half-castes and black-traders are most brutal in the treatment of their slaves, the Arabs, on the contrary, as a rule, treat them kindly Slaves taken from the centre of Africa, like these, do not, as a rule, reach the coast on the contrary, they are taken down to Sékélétu's country, where, owing to several causes, the population is scanty, and slaves are in demand and are sold for ivory, which is afterwards brought to the coast—a caravan usually making a journey towards the centre and then on to Sékélétu's country, and so on alternately.

On our next few days' march we passed near the sources of the Lomâmi, and we also passed several streams running into the Luburi, which is an affluent of the Lualaba. All this country was very beautiful with hills and woods, and marvellously fertile. Here we were beginning to rise out of the broad valley of the Lualaba, and as we came to a height of about 2600 feet above the sea, the oil-palm ceased to flourish Before this, in the valley of the Lualaba, the oil-palm-tree had been most wonderfully plentiful; indeed, the people of Bihé carried down large quantities of oil with them to sell in their own country. The country of Ussambi, which we were passing through, is a State which properly belongs to Kasongo, the natives, however, pay tribute both to Kasongo and Mata Yanvo, as, being much nearer to the latter chief, they are afraid of being persecuted if they neglect his claims All of them say that Kasongo is their proper chief.

From this place we went on through Ulûnda, which name

Mr Cooley says means wilds or forests, and, I should think, with a very great deal of truth, as the whole country is a mass of jungle, the only small clearances being just about the villages, and they only consist of two or three huts, with three or four acres of clearing.

Passing through Ulûnda, I heard that Mata Yanvo was in flight from his capital, having committed some atrocious barbarities on a woman. One of his sisters, who was almost as great a person in the country as himself, had formed a conspiracy against him, and he was obliged to fly with three or four of his own immediate followers, and was then on the road to his kinsman and friend, Kasongo, to ask assistance to reseat himself on his throne

After Ulûnda we came into Lovalé, and passed close to the sources of the Lulua and the Zambesi, beyond these we came to enormous plains which, in the rainy seasons, are covered with water about knee-deep, and this extends across between the affluents of the Congo and the Zambesi. There are enormous quantities of fish all over the country when flooded, and the natives take advantage of the slight differences of level to build small dams, by which, when the floods subside, the fish are imprisoned These fish are then dried, and form a very important article of commerce with the people on either side, in fact, we were obliged to buy fish with other stores, because we were told that people in front would accept nothing but fish, saying that people coming from the interior ought to lay in a store as they passed through the fish districts. I passed across Dr. Livingstone's route from Sékélétu's to Loanda at Kalendi's, and found that the people still remembered him from the fact of his having had a riding-ox I did not see Lake Dilolo, although I heard sufficient about it to enable me to place it pretty correctly, and I believe it agrees very nearly with Dr. Livingstone. At this time the Kassabi was at a varying distance of from ten to fifteen miles to the north of us, and continued so until we passed near its source. After a few days, we came on to Sha Kelembe's, a place at which the map which I forwarded of the interior terminated, and which was also the boundary between Lovalé and Kebokwe. From there we began to leave the plains, and to get gradually into a hilly country, and went on to Mona Peho's, where we were detained two or three days. Kebokwe is a hilly and well-wooded country, and well watered, but almost the only produce is beeswax, of which there are enormous quantities collected by the natives, and many caravans from Bihé and Bailûnda come there to buy it. Out of the honey, which otherwise would be a mere drug in the market, they make a sort of mead, which is quite clear, and rather strong. Peho is chief of only a portion of Kebokwé, the country, in the time of his grand- or great-grandfather, having being split up into four parts, which are now independent of each other.

From Peho's we turned slightly north of west, and passed close along by the sources of the Lumeji, which takes its rise from a small basin, about seventy yards in diameter, at the upper end of a narrow valley. A few days after leaving Peho's we got into Kimbandi, and there we met the first regular caravans from Bihé, who were there collecting beeswax, and also some belonging to Silva Porto, under charge of slaves going to Katanga.

The country here became more hilly, and continued till we came close upon the Kwanza, where I passed the Kwanza it was ten or twelve feet deep, and from 120 to 130 yards wide. The country on both banks of the Kwanza is called Kimbandi, but about an hour and a half, or so, from the river Bihé commences, the Ganguellas, which may be seen marked on some of the old maps. It is merely a collective term for the tribes eastward of Bihé, and means much the same as the term Washenzi in the Zanzibar language—simply the uncivilised or heathen people.

After the Kwanza we next crossed the Kokema, one of its important affluents, which at that point was some 50 yards wide and about 10 feet deep. The next day we arrived at Komananti, a settlement of Alvez, which was joined on to a native village. Here I was again delayed for a week by Alvez putting off things, and saying that he wanted to get guides, and get this and that. After that, I left there with another man, who was a partner of his, but who behaved much better, and who was to be my guide right on to Benguéla. The first day after we left we marched a long distance, and arrived at a village belonging to Señor Guilhermé Gonçalves, a Portuguese merchant, settled at Bihé, and the next day we arrived at Kagnombe's, the chief of all Bihé. This town was the largest I had seen in Africa, being 4 or 5 miles in circumference, but a large portion of the interior was taken up by pens for pigs and cattle, and tobacco grounds, there were also three gullies, in which were sources of streams flowing to the Kokema. I had to present King Antonio (Kagnombe as he called himself) with a gun, and a leopard-skin which I had spread out in the hut that was given to me to sleep in. When the secretary, who could not write, called to see me, I was told I must give him something, or else there would be trouble. The next morning I went to see King Antonio, and first of all went into a small outer court, the doors of which were guarded by men wearing red waistcoats with white backs, whom he called his soldiers, some were armed with bows and others with spears, and a few of them with old flint-lock muskets. They only put down a stool for me to sit on, and brought in a large leather chair, studded with brass nails, for Kagnombe, on this I sent up to my hut to get my own chair to sit on After a time King Antonio arrived, dressed in a suit of black clothes and an old wide-awake hat, but without any boots, and a Scotch plaid over his shoulders, and held up by a small boy, and looking very drunk indeed. He first informed me that he was a very great man, but that as he had heard I had been so long on the road he did not want a great present, but I must remember him if ever I came back there again He also informed me that he was not the same as any of the other chiefs in Africa, because his name was Antonio Kagnombe, and that his likeness had gone to Lisbon, and I must not think he had not finer clothes than those he had on, because he had clothes with gold-lace and other fine things After a while we went into an inner enclosure, and there the stools and chairs were arranged in a circle, and he went to one of his houses and brought out a bottle of aguardiente, and wanted everybody to have a drink round, but he took care to have the largest nip for himself, after which there was a little palaver and I went away to my hut, and the next morning I got away and marched over to the house of Señor Gonçalves Here I was astonished at finding myself in civilisation once more The dining-room into which I first went was all painted in a pattern, and the ceiling made of white cloth, and a clean cloth on the table, Vinho Tinto to drink, and good cooking, with preserved meats, butter, and other things of that sort, and tea, coffee, and brandy I had only come there with a small party, leaving most of them to go straight from Komananti to the house of another Portuguese trader, as I had to make a considerable round in order to pass by the chief's town to Señor Gonçalves' own settlement

Remaining there one night, I marched through an open prairie country, with a few bushes and trees, and intersected by many streams, to the settlement of João B Ferreira, who enjoys the position of a district judge, on account of his having travelled a good deal. I had heard of his having reached nearly to Kasongo's country before, and he was now preparing for a journey in the same direction, in order to buy slaves to sell for ivory in Sékélétu's country. He was very civil and hospitable, but there is no doubt the presence of men of his stamp in the country must injure the prestige of Europeans, even Señor Gonçalves, who is a very nice and gentlemanly man, is not allowed to go into either of the chief of Bihé's own enclosures. There is a sort of banyan-tree a short way outside them, underneath which are several stones, on the highest of which King Antonio takes his seat, and the white traders have to sit down almost at his feet. Close to the settlement of Ferreira is that of Señor Silva Porto, which is now in charge of slaves, Señor Silva Porto having settled at Benguéla, he is, no doubt, known to most here from his travels, which were discussed by Cooley and MacQueen. Just after leaving Ferreira's settlement we passed over a country reminding one very much of the Wiltshire Downs, with large clumps of trees surrounding small villages, and in the dips between the different rises, streams, some flowing to the Kokema, others into the Kuito and Kutato. On leaving the country of Bihé we arrived in Bailunda, the boundary between the two being the Kutato, where we saw an extraordinary sight. A moderate-sized stream came up from the south-east, but where we crossed there was a regular burst of cascades from the hill-sides, supplying at least two-thirds of the water that was running down the main stream, the water came out of the sides of the hill just like the cascades at the Crystal Palace, except that it was much more picturesque. From this place we marched through one of the loveliest countries you can imagine, mountains in all directions, of beautiful forms, many of them covered with trees, small knolls, crowned by villages, sheltered by enormous trees, having a very European appearance. Some of the views require a Longfellow or a Tennyson to describe, or a Claude or a Turner to paint. Passing through this country we had a great deal of rain, and my men began to break down at a place called Humbi; one of them died. The day after, as I was bringing up the rear of the caravan, I found I could not get the men along at all, taking eight or nine hours doing what might have been marched in about three. On arriving in camp, I set to work to think what I could do I knew that my India-rubber boat was no longer required, I therefore threw it away, also my bed, tent, and every other thing I could possibly get rid of, and picking out about half-a-dozen men who were the strongest of the party, set off to walk the 126 miles between this and the coast with them, leaving the others to follow more leisurely, and promising to send back assistance. The next day we reached the highest camp in our journey, 5807 feet above the sea, and the mountains were about 400 or 500 feet higher. The next morning we commenced to descend towards the sea, but we had very rough mountainous walking, and several largish rivers and streams to cross, much of the road lying through passes between steep and rocky hills, on the sides of some of which were clustered small villages that could hardly be distinguished from the rocks, and in the bottoms was a great deal of cultivation. Three days after leaving the main body of the caravan, we arrived at Kisanji, the first place where we found that milk was to be got, although the first place that we saw cattle was in Lovalé. From Kisanji to the coast there are no inhabitants, the whole being a desolate tract of mountains, the march lying through passes and over granite rocks. Skeletons lying by the side showed the severity of the march, signs of the slave-trade still remaining in slave-forks and clogs lying by the road-side. We were a day and a half going through the Supa Pass, which was all rough, hard walking, some parts of it being as difficult as almost any mountain work. Down the bottom of the pass flows a stream, which joins with another that flows into the sea at Katombela, and which stream is called the Supa, or Pé supa. After leaving the pass we went across a barren plain till we came close to the coast, and then we came upon what appeared sea-cliffs facing the land, as if a continent had sunk in what is now the Atlantic, and Africa had been upheaved afterwards. This was the first limestone formation that I had seen since leaving the East Coast, except a few patches at the south end of the Tanganyika. A large portion of the rocks seemed to be made of chalk, and there were numerous ammonites and other fossils. During the whole of this march from the main body, which only occupied five and a-half days, I was suffering from great pains in my back and legs, and the morning I arrived at Katombéla a severe attack of scurvy set in, and for three or four days I was neither able to speak nor swallow, but the excitement of getting to the coast kept me up. At 45 miles from the coast we sighted the sea, and our feelings were even more thankful than those of Xenophon's Ten Thousand, when they cried, "θάλαττα, θάλαττα." I was rather puzzled in my course just before reaching the coast, as I had understood that Katombéla was inshore of Benguéla, and I thought I was going too far north and overrunning my longitude, but I found Katombéla was on the sea-coast and to the north of Benguéla, and that I was perfectly correct. On arriving at Katombéla I was received and welcomed in the kindest manner by Monsieur Cauchoix, a French merchant, who had received my letter the day before, and was on his way out to meet me. Most of the country from the Tanganyika to the West Coast is one of almost unspeakable richness. Of metals, there are iron, copper, silver and gold, coal also is found; the vegetable products are, palm-oil, cotton, nutmegs, besides several sorts of pepper and coffee, all growing wild. The people cultivate several other oil-producing plants, such as groundnuts and seni seni. The Arabs, as far as they have come, have introduced rice, wheat, onions, and a few fruit-trees, all of which seem to flourish well The countries of Bihé and Bailunda are sufficiently high above the sea to be admirably adapted for European occupation, and would produce whatever may be grown in the south of Europe The oranges which Señor Gonçalves had planted at Bihé, where he had been settled for over thirty years, were finer than any I had ever seen in Spain or Italy He also had roses and grapes growing in luxuriance, but he having been away for three years, many things, such as potatoes and other European garden-plants, had been lost, but he assured me that when he had taken care of them they had always come to perfection

The main point among the discoveries I made I believe to be the connection of the Tanganyika with the Congo system The Lukuga runs out of the Tanganyika, and there is no place to which it can run but to the Luvwa, which it joins at a short distance below Lake Moero. The levels I have taken prove most conclusively that it can have nothing whatever to do with the Nile, the river at Nyangwe being between 1400 and 1500 feet above the sea, while Gondokoro is over 1600 feet And also in the dry season the flow of the Lualaba is about 126,000 cubic feet per second, that of the Ganges, which is far larger than the Nile, being not more than 80,000 cubic feet per second in flood-time, and that of the Nile at Gondokoro, below where all the streams unite, is between 40,000 and 50,000 feet per second Many large rivers flow into the Lualaba below Nyangwé

There is in the centre of Africa a water-system which might be utilised for commerce, which has no equal upon the face of the globe Between the large affluents of the Congo and the head-waters of the Zambesi a canal of between 20 and 30 miles, across a level sandy plain, would join the two systems, and the River Chambezi, which may be accepted as the head stream of the Congo, ought to be navigable to within 200 miles of the north of Lake Nyassa To the eastward of Lovalé ivory is marvellously plentiful The price amongst the Arab traders at Nyangwé was 7½ pounds of beads, or 5 pounds of cowries, for 35 pounds of ivory, and the caravans that went out from there for ivory would obtain tusks, irrespective of weight, for an old knife, a copper bracelet, or any other useless thing which might take the fancy of the natives The blot upon this fair country is the continuance of the slave-trade, which is carried on to a great extent, to supply those countries which have already had their population depleted by the old coast-trade. The chiefs, like Kasongo and Mata Yanvo, are utterly and entirely n-responsible, and would give a man leave, for the present of two or three guns, to go and destroy as many villages, and catch as many people as he could for slaves The Warua especially, although holders of slaves, would rather die than be slaves themselves. I have heard instances of their being taken even as far as the Island of Zanzibar, and then making their way back, single-handed, to their own country. The Portuguese are the principal agents in this trade, as they are able to dispose of them advantageously for ivory and other products in many countries The Arabs, as a rule, only buy enough slaves to act as their porters and servants for cultivating the ground round the permanent camps The people of Bihé, who work under Portuguese, are most cruel and brutal in their treatment of these unfortunate wretches. I have interfered sometimes, and would have interfered far oftener if I had not found that my interference brought a heavier punishment on the unhappy beings when my back was turned The only thing that will do away with slavery is opening up Africa to legitimate commerce, and this can be best done by utilising the magnificent water-systems of the rivers of the interior

On the conclusion of the Paper, Sir HENRY RAWLINSON, President, addressed the Meeting. He said —Ladies and gentlemen, I rise, by permission of his Royal Highness, our Honorary President, and on behalf of the Council of the Royal Geographical Society, to express the very high opinion which we entertain of the services rendered to Geography by Lieutenant Cameron, and I hope I may be allowed to state that we consider those services not only as rendered to the cause of Geography, but as being equally interesting to the politician, to the merchant, and to the philanthropist It would take too long were I to follow Lieutenant Cameron's footsteps throughout his most adventurous and important journey, but I hope I may be allowed to state in a few words the chief results that have accrued from that journey Although he himself makes almost light of the journey, and we might think it a mere party of pleasure, I must recall to your recollection that this gallant young officer traversed on foot a distance of 3000 miles, that he was continually, or with very short intervals, on the tramp for two years and eight months, exposed to all the vicissitudes of climate, to forests, marshes, jungles, and to hardships of all kinds, and yet his courage never gave way He was upheld by that stout English quality which we call pluck—a quality which rises higher the more difficulties increase Upheld by that quality, he pushed on, determined to do his duty, and at all risks carry out the objects which had been entrusted to him The services which Lieutenant Cameron has rendered to Geography are very essential He has not been a mere explorer —one of those travellers who carry their eyes in their pockets He always kept his eyes well about him, and the observations which he made, both astronomically and in regard to the physical character of the country, are of extraordinary value The register of observations which he has brought home, and which are now being computed at the Observatory at Greenwich, promises to be of a most important character. They are astonishingly numerous, elaborate, and accurate, and I have great expectation the result of computing those observations will be, that we shall have a definite line laid down from one sea to the other across 26° of longitude, which will serve as a fixed mathematical basis for all future geographical explorations of Equatorial Africa Among the minor objects—if I may so call them where everything is of importance—achieved by Lieutenant Cameron, must be noticed his circumnavigation of the great Lake Tanganyika, and his discovery of the outlet whereby that lake discharges its waters into the great River Lualaba Another very important matter is the identification, as nearly as possible—not absolutely proved by mathematical demonstration, but from a large field of induction,—that the Lualaba is the Congo One of the main objects of the Expedition was to follow down the course of that river so as to prove or disprove the identity of the Lualaba and the Congo. Lieutenant Cameron was not able, as he explained to you, to carry out that scheme in its entirety, but he collected sufficient information on the spot to render it a matter, not of positive certainty, but of the highest degree of probability, that the two rivers are one and the same Another great discovery of his is the determination of a new river-system between the valley which he followed of the Lomami, and the scene of Dr Livingstone's discoveries This valley, which consists of a large river running through a series of lakes, forms, as he fully believes, and as I also believe, the course of the true Lualaba Let me now direct attention to a few of the other practical results of Lieutenant Cameron's travels The observations which he has furnished respecting latitude, longitude, and elevation, amount to the extraordinary number of nearly 5000, and naval officers and surveyors will understand the extraordinary minuteness and assiduity with which he did his work when I state, that in order to determine the longitude of some particular positions, he took as many as 130 or 140 lunar observations at one single spot With regard to the political results of his journey, I may remark that he has discovered a new distribution of political power in the centre of Africa of which we absolutely knew nothing whatever before We had never so much as even heard the name of this great chief Kasongo, who appears to be the most powerful potentate in all Equatorial Africa The ascertaining of the power of this chief is a most important element in the future of Africa, for whatever negotiations may be carried on, or measures, adopted for the suppression of the slave-trade, will have to be carried on or adopted mainly through the medium of this great chief Kasongo I must also remind you of the commercial result Lieutenant Cameron has announced to us for the first time that in this great mart of Nyangwe, or in its vicinity, the trade-routes from the East and West Coasts of Africa unite in a common centre The Portuguese half-caste traders from the West Coast there meet the Arab traders from the East Coast He has further informed us of very valuable products which exist in those countries, and of which use may be made in future, including not only cereals, but also all sorts of metallic treasures, gums, copal, and various other most valuable articles, of which he has brought specimens to this country. The information which he has given us with regard to the slave-trade is a valuable result of his labours He has tracked this atrocious traffic to its fountain-head, to those tracts of country and villages that have been harried and depopulated by the slave-dealers, and he has shown us how legitimate trade may be introduced so as to supplant the slave-trade He has thus done a great service, not merely to Geography, but to philanthropy and civilisation. We pay all possible honour to the old pioneers of African discovery. we can never forget the services which have been rendered by Captain Burton, by Speke and Grant, by Sir Samuel Baker, and I will say also by Mr Stanley, and by the French and Germans now travelling in the interior of Africa, but we do feel ourselves called upon to acknowledge the—I will not say superior, but fully equal—merits of Lieutenant Cameron We consider him a worthy successor of the great travellers who have gone before him, and I must remind you that his success does not by any means depreciate or disparage the value of the discoveries which have preceded his career. He is not the rival of Livingstone he has no idea of superseding Livingstone, all that he proposes to do is to enlarge and supplement Livingstone's discoveries. There is no question—and Lieutenant Cameron would be the first to admit it—that he has been greatly indebted to Livingstone for suggestions and information which have guided his own footsteps. Dr. Livingstone's map was consulted by him at Ujiji, and he also had the advantage of using certain instruments which he found in charge of Livingstone's party in their memorable journey to the coast One of these instruments was a chronometer, an historical chronometer, which the readers of Livingstone's travels may remember he speaks of with great affection, and which he styles, in a playful way, his "dead chronometer" It is an instrument which will only go for three hours and a half, but for that time it goes perfectly. It was that instrument which Lieutenant Cameron used in taking and registering something like five or six hundred lunar observations. It must be extremely gratifying to him, I am sure, to see the crowded meeting which has assembled this evening to do him honour. He must be very gratified, too, at our Honorary President having done us the honour to take the Chair on this occasion, with that solicitude for the honour and interest of the naval profession which has always characterised his Royal Highness. But Lieutenant Cameron must regret very much the absence of some of his most ardent admirers and patrons, especially Sir Bartle Frere, who started him on his journey, but has not arrived in time to welcome him on his return No one, I am sure, would have welcomed him more heartily and cordially than Sir Bartle Frere, to whom, indeed, we owe a deep debt of obligation for having sent him forth so well furnished from Zanzibar. I will now only state, in conclusion, that as a proof of the estimation in which he is regarded by the Royal Geographical Society, at our Council Meeting yesterday, having weighed the claims of all the most prominent discoverers of the day, we decided deliberately that Lieutenant Cameron was entitled to the first place, and we accordingly adjudged him what has been called "The Blue Riband of Scientific Geography," namely, our principal Gold Medal of the year

Dr BADGER said when Lieutenant Cameron came to him in 1872, just before starting from Zanzibar, the impression he left was that he had not the physique for so long and arduous a journey, and that he was of too quiet and gentle a disposition to deal with the roughs and savages he was likely to meet with in Central Africa. In answer to his request, however, how he was to get on with the Arabs and other people in Africa, he (Dr Badger) recommended him by all means to keep his temper, and never, on any account, to act upon the aggressive, for he felt that, besides a good deal of pluck, he might, like many other officers of the Royal Navy, have a good deal of pugnaciousness, notwithstanding his quiet demeanour Nobody could be more delighted than himself to find that both his inferences were incorrect. Notwithstanding his long and arduous journey, Lieutenant Cameron now seemed to be more robust than he ever was before, and in regard to temper, long-suffering, and forbearance, his journey was unprecedented. The only occasions when he showed anything approaching to temper were when he gave one man a thrashing, shot another man in the leg who attacked the camp, fired two shots close to somebody else, burnt four or five huts, and felt inclined to shake another out of his rotten clothes Lieutenant Cameron never talked about the "Dear Africans" or the "Dear Negroes," but he certainly seemed to have acted like a philanthropist towards them, and it was one glorious feature in his journey through Africa that it had been bloodless

Admiral Sir ALEXANDER MILNE said there were many naval officers present who had in former days left their names on the pages of history by their voyages and endurance in the Arctic regions—one, for instance, who, fifty years ago, traversed the whole coast of Canada down to the entrance of the Mackenzie

River. They were well competent to judge of what travelling is, and he was sure he expressed their opinion as well as his own, and the opinion of the captain of Her Majesty's ship *Sultan*, and the service in general, when he said that Lieutenant Cameron had done what every naval officer would be inclined to do if he had the opportunity. He had achieved a service which no other naval officer had had the means of doing, and he had added glory not only to his own name, but to the service to which he belonged. The mementoes of his journey exhibited at the Meeting* showed that Lieutenant Cameron was not one who would ever be inclined to strike his colours.

HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH said he thoroughly endorsed every word that Sir Alexander Milne had uttered, and he thought the resolution which he now wished to propose would be unanimously and most cordially supported on all sides. He congratulated the naval service upon the additional lustre which had been cast upon the profession, and proposed a cordial vote of thanks to Lieutenant Cameron for the Paper which he had read.

SIR HENRY RAWLINSON proposed a vote of thanks to his Royal Highness for the honour he had done the Society by presiding on this occasion. The Geographical Society felt itself very much honoured when his Royal Highness consented last year to take the office of Honorary President; they were still more honoured by his presence that evening. As Englishmen, they all felt a personal pride in finding the son of their Queen prepared not only to take a deep interest in a practical science like Geography, but also to show such particular solicitude for the honour and interests of the naval profession. He trusted that his Royal Highness would on other occasions favour them with his presence, whenever a suitable occasion arose.

Eleventh Meeting, 8th May, 1876.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Abraham Gould, Esq.; Hon. George Denman.*

ELECTIONS.—*Hugh Lyttleton Arbuthnot, Esq.; John Bateman, Esq.; Jameson Elles, Esq.; Col. E. L. M. Evans; Lieut.-Col. Spiller Ferris; J. S. Forbes, Esq.; P. L. Henderson, Esq.; Joseph Hughes, Esq.; Hugh Heywood Jones, Esq.; Henry Kay, Esq.; John Montgomery, Esq.; Major Frederick Mullener; Capt. William B. Pauli,* R.N. (British Consul, Porto Rico); *Charles Manley Roberts, Esq.; Bridgman Smith, Esq.; Lieut.-Gen. James Travers,* V.C.; *Coutts Trotter, Esq.; Robert B. Woodd, Esq.*

DONATIONS TO THE LIBRARY, 10 APRIL TO 8 MAY, 1876.—Shifts and Expedients of Camp Life, 2nd edn., by W. B. Lord and T. Baines, 1876 (*W. B. Lord, Esq., R.A.*). Revue Maritime et Coloniale, 8 parts, of Vols XVI. XIX.–XXII. and XXVI., in completion of series (*The French Minister of Marine*). Journal of the Ethnological Society of London, Vols II (all now in print) and III, and 3 parts of Vol. II. 2nd series, and Transactions, Vol. I part 2, in completion of series (*The Anthropological Institute*). Geological Survey of India, Records, Vol VIII, 1875, and Memoirs, Series IX, pts 2 and 3, Jurassic Fauna of Kutch, by W Waagen (*The Geological Survey*). De Reis der Pandora, door L R. Koolemans Beynen, 1876 (*The Netherlands Geographical Society*) Voyage en Asie, par T Duret, 1874, Notices sur les collections de M H. Cernuschi, L'extrême Orient, par A. Jacquemart, 1874, Mécanique de l'Échange, 1865, La Monnaie bimétallique, and Bimetallic Money, 1876, by H Cernuschi (*M Cernuschi, per G Chapman, Esq*) The Shores of Lake Aral, by Herbert Wood, 1876 (*Author*) Nouvelle Géographie Universelle, par Élisée Reclus, Vol. I (*Author, per Hachette & Cie*) Climat de Mogador, par C Ollive, 1875 (*Author, per Trovey Blackmore, Esq*). London, England, Schottland, und Irland, Meyer's Reisebucher, von E G Ravenstein, 1876 (*Author*) Madras Presidency Manuals Nellore district, by J A C Boswell, 1873, Bellary district, by J. Kelsall, 1872, Cuddapah district, by J D B Gribble, 1875, and Vizagapatam district, by D F Carmichael, 1869 (*H. M. Secretary of State for India, per C R Markham, Esq*). Selections from the Records of the Punjab, new series, Nos XII and XIII (*H. M Sec. of State for India*) Anti-vaccination, by J. Pickering, 1876 (*Author*). International correspondence by means of numbers, 1874 (*Author*). Ueber das Verhaltniss der Topographie zur Geologie, von J M. Ziegler, 2nd edn, 1876 (*Author*) Palestine Exploration Fund Reports on Progress, Nos. XXVI, XXIX, and XXX, Preliminary Report of journey through the Desert of the Tîh, by E. H Palmer, 1870, and Quarterly Statement, new series, No III, towards completion of series (*E Stanford, Esq, per Mr. Bolton*) Archæological and Historical researches on Peking and its environs, by E. Bretschneider, 1876 (*Author*) Introductory sketch of the history of the Shans in Upper Burma and Western Yunnan, by N Elias, 1876 (*Author*). Catalogue to illustrate the animal resources of the Dominion of Canada, by A M. Ross, 1876 (*Author*). Notes on the Geology of part of the Duffla hills, Assam, by H. H. Godwin-Austen, 1875 (*Author*). Les Isthmes Américains; Projet d'une exploration géographique pour le percement d'un Canal, par L. Drouillet, 1876 (*Author*) Index Lichenum hyperboreorum, by E. Stizenberger, 1876 (*Author*) Mines and Mineral Statistics of New South Wales, with notes by W. B. Clarke and Prof. Liversedge, 1875 (*The Australian Government*). Sobre a existencia do terreno siluriano no Baixo Alemtejo, por J. F. N. Delgado, 1876 (*Author*); and the current issue of publications of corresponding Societies, &c.

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* An allusion to the tattered flags carried on his journey, which were exhibited on the platform.

DONATIONS TO THE MAP-ROOM FROM 10TH APRIL TO 8TH MAY, 1876.—Geological map of Australia, Geological map of Victoria, 6 geological maps of portions of Victoria, Map showing distribution of Forest Trees in Victoria, Map of E. Giles' route from Beltana, in South Australia, to Perth, Western Australia (*Jess Young, Esq.*). 3 maps illustrating Cernik's expedition to the Euphrates and Tigris, Map of the country round Peking, by Dr. Bretschneider; Map of New Zealand and Tasmania (*Dr. A. Petermann*). Map of the Ortos Country and adjacent parts of Mongolia (*Ney Elias, Esq.*). 13 Admiralty Charts (*Hydrographic Office*). Map of reconnaissance in East part of Kordofan, Map of part of the Kingdom of Adel, between Zeila and Harrar, Plan of the Town of Harrar (*General Stone, Chief Staff, Egyptian Army*).

The PRESIDENT said he thought it was due to the Society that he should give some explanation of the circumstances which gave rise to some dissatisfaction on the part of the Fellows at the last Meeting, owing to their inability to obtain sittings. The Society now numbered over 3000 members, each of whom had the privilege of introducing a friend, and it was no easy matter to find a room in London capable of accommodating 6000 persons. The Council did all they could by engaging a larger place of meeting like St. James's Hall, which they hoped would hold all the members who desired to attend and their friends, but Lieut. Cameron's travels were of such exceeding interest, that the gathering was larger than was anticipated, and many of the Fellows were disappointed at not being able to obtain places. The Council had, however, done their best; and if any similar occasion should arise, though Camerons were rather rare articles now-a-days, there would be nothing left for the Council but to invite the members to meet them in the Albert Hall, the only building in London that was at all suited to their requirements. With regard to the current business of the evening, unfortunately both of the Secretaries were absent—Mr. Major from ill health, and Mr. Markham from family affliction—but in their place he had been able to avail himself of the services of Dr. Mullens to read the Papers on New Guinea, and his acquaintance with that country would enable him to explain any difficulties that might arise.

The following Papers were then read by Dr. Mullens:—

1.—*Description of the Country and Natives of Port Moresby and Neighbourhood, New Guinea.* By OCTAVIUS C. STONE, F.R.G.S.

[EXTRACTS.]

SIR, Somerset, February 22, 1876.

I had the honour of writing you a short note from Anuapata (Port Moresby), last December, giving some account of my experiences in the Eastern Peninsula of New Guinea, wherein I stated that, owing to the great difficulty, and at other times utter impossibility, of procuring native carriers or guides, I and my party had been unable to penetrate more than 25 miles inland. I now take the liberty of sending you a more detailed account of my observations

In a former letter from Somerset I hazarded the opinion that Timor ponies would be eminently suited to insure the success of any lengthened journey into the interior, and having since proved, to my satisfaction, the unreliable character of the natives to act as carriers, that opinion is now strengthened. As a cattle-country, the immediate neighbourhood of Anuapata is well adapted, and I would now venture to suggest the introduction of *goats* by any future Expedition proposing temporary location

When we arrived at Anuapata on the 29th of October, 1875, the hills around presented a barren and parched-up appearance They jut out into the sea in a succession of low conical mounds, averaging 400 feet high, forming a range on either side of the harbour, and becoming higher the further they recede from it Their formation is limestone, and mixed with a covering of the poorest soil are fragments of decayed coral, while the sides are strewn with pieces of rock, among which a red translucent sort of flint, called by the natives *vesika*, is predominant, and also a white non-auriferous quartz A seam of plumbago runs along the eastern shores of Fairfax Harbour, continuing in a more or less pure condition for a couple of miles, and it is the only metal which I positively know exists The three villages of Anuapata, Tanapata, and Elevara, containing a total population of nearly 700, are situated on the beach east of the harbour at a distance of 2 miles from its opening, behind them extends a valley of the same length; while Mount Tapaharti, rising, like the keel of a boat, 750 feet high, closes it in The sides of all these hills partake of the same barren nature, being partially covered by open forests of gum-trees (*Eucalypti*), averaging 8 or 10 yards apart, the intervening spaces growing coarse grass, 7 or 8 feet high, which is annually burnt down in the month of September, when it has become dried, like hay, from the excessive droughts and solar heat Patches of dark-foliage scrub or jungle usually clothe each mountain gully and ravine, at rare intervals the lower portion of the hill-sides being similarly adorned. These trees are alive with the songs of birds, among which parrots and doves, of various species, are the most common The hills along the coasts must have risen from the sea-level within a comparatively recent epoch, for shells, like those existing in the sea at the present day, are found at a height of no less than 600 feet The whole country is broken up into hills, mountains, detached chains, and valleys, such chains usually running nearly parallel with the coast, but becoming less regular and not so numerous as they approach it. Hence for the first 20 miles fairly fertile valleys and plains are not unfrequently met, though the mountain-slopes, which may be said to occupy three-fourths of the entire area, still retain their unkindly, barren, and rocky nature The land, nevertheless, becomes gradually more fertile as you approach the interior, and after passing the river Laroki, 10 miles distant, numerous mountain-streams and water-courses cut it up in various directions, assisting in no slight degree to the desired end At the twentieth mile a total change in the character of the country is at once observable, and with it the bird of paradise (*Paradisea raggiana*) and two other species are immediately seen The gum-trees and open country then give way to dense forests of tropical vegetation, tall trees, and undergrowth, which completely cover the northern ranges, excepting the upper part of Mount Owen Stanley, with one impenetrable mass of foliage Their summits become rounder, less undulated, and their heights increase to 4000 feet as they near the great central backbone of the Peninsula, when Mount Owen Stanley rises in a double peak to a height of 13,205 feet The face of this mighty rock is rent into a series of volcanic irregularities, crevices, and chasms, throwing out arms in a westerly direction, while what I take to be an extinct crater exists below the western peak The more easterly of these peaks is called Bitoka, and the other Birika. A narrow gap, seen some 8 miles to the south, and in a nearly north-east direction from Anuapata, is the only one discernible in this imposing range, whose average height is about 8000 feet, and it is probably through this opening that the easiest way of crossing the Peninsula will be found. Native tracks are numerous in the open country, and likewise penetrate these interminable forests, winding sometimes over the hills, and at others along the course of rushing streams. Mount Vetura is situated 17 miles north-east of Port Moresby, and is, from its peculiar shape, an unfailing landmark. It forms the south-west point of the Vetura Range, whence it rises in a pagoda-shaped mound to a height of 1200 feet, the lower part being clothed with vegetation, while tufts of grass are seen clinging to the bare rockwork above, which is worn into a succession of irregular steps, with vertical rents in them, though the strata run nearly horizontally This range may be 2 miles wide and in length 8 or 10, curving round to the north-east, and forming on its west or inner side an amphitheatre of hills, 1000 feet high, which includes within it the district of Munikaira and several villages. Upon the summit, at a height of 1600 feet, is a table-land, sloping slightly inwards, covered at its southern extremity with gum-trees (*Eucalypti*), and then changing into dense scrub. The southern side rises from the valley beneath, like the walls of some leviathan fortress, and on the inner side the rocks fall perpendicularly for a distance of 200 feet,* whence grass-covered slopes trend towards the stream below Leaping from the table-land over the tall cliffs is a cascade called *manahu*, which falls in one unbroken volume into the gorge that conducts its waters to the Vetura Rivulet † This stream averages ·15 yards wide, and when I saw it (in December) was 2 feet deep, running in a westerly direction with a current of 3 miles an hour, though after severe rains it is much swollen, overflowing its banks in many places, and assisting to give nutriment by this means to the belt of tall trees that rise on either hand A valley separates the most northerly point of Mount Astrolabe—*Variata*—from Vetura to its north, and through this winds the river, called Laroiki, already mentioned, when it takes a turn northwards towards the high mountains. It is sometimes spoken of as the Manumanu by the inland tribe, flowing westward, and falling into the sea at the village of that name, situated at the mouth of the Usborne, in Redscar Bay, which is, no doubt, one and the same river, or a branch of it On the authority of several natives I am informed that another branch of the same river empties itself into the sea at Karo, a village immediately to the south of Hood Point The width where we crossed it, nearly 30 miles in a direct line from its mouth, was 25 yards, depth 6 feet, and current 4 miles an hour, while its waters must remain fresh until within a comparatively short distance of the sea Owing to the force and depth of this current, our baggage could not be carried over, so a raft had to be constructed, and firmly secured by long ropes before launching it on the rolling tide The banks, which are of rich black soil, rise abruptly to a height varying from 4 to 10 feet above the surface. A few miles lower down, where I first came upon it, they were of the former height, hence, after heavy rains, it overflows at such places, creating swamps on its subsidence A belt of trees on either side, some of whose trunks measure 4 feet in diameter and 100 feet high, growing perfectly erect and void of lower branches, marks the river's course. The river is nearly clear of snags and fallen trunks, but its rapidity and its numerous sharp windings condemn it for purposes of navigation, excepting to small steam-launches The Vetura Rivulet flows into it a little west of the point at which we crossed, and it receives the waters of several smaller streams. Among these the Baikana, 6 miles on the track thither from Anuapata, 14 feet wide and 3 feet deep, may be mentioned On the road to Mount Astrolabe, 9 miles in a E N E direction, such another stream is crossed, flowing southwards towards Bootlers Inlet, as well as numerous dried-up watercourses, varying in size from mere ditches to ordinary brooks During the rainy season these must all be, more or less, filled with water Many parts of the country are divided into districts, which vary in name from the villages they respectively contain

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* The appearance of this mountain reminded me of Gunib—Shamyl's stronghold in the Caucasus

† After the manner of the Staubach, near Interlaken, in Switzerland.

The inhabitants of each village own the country for several miles around The members of each family possess a plot of land as near as possible to their own homes, the boundaries of which are clearly defined and understood by their next neighbours, if not by the entire village Either the whole or a part of this is neatly fenced in and planted with bananas In the neighbourhood of Anuapata the hill-sides are covered by such plantations, which must occupy a total area of some 350 acres Yams and taros, disposed in very limited quantities among the bananas, constitute the remaining portion of the agricultural produce of Port Moresby Owing, however, to the inferiority of the soil, many fail to bear, and none attain that perfection which we find them doing in the interior There the frequent rains among the mountains cause the soil to become very life-giving and nutritious, so that the land possesses all the qualifications necessary to its successful cultivation Bananas grow luxuriantly, while sugar-canes, yams, taros, and sweet potatoes attain an immense size The breadfruit-tree (*Gardenia edulis*), betel (*Areca catechu*), mango (*Mangifera indica*), called *yali* by the natives, and sago palm (*Sagus Rumphii*), are indigenous, though the latter is scarce, abounding in Ilema, and further north-west in large quantities Tobacco is cultivated in the interior, and I likewise found chillies, cucumbers, water-melons, vegetable-marrows, and small purple grapes A rose-coloured stone fruit, resembling an apple in form and taste, having a white pulpy interior, called by the natives *maita*, was plentiful Wild oranges grow sparsely in the vicinity of Yule Island. *Roro*, and the nutmeg-tree (*Myristica fragrans*), is abundant more to the west, near the Fly River That other tropical fruits and spices would flourish in the interior of the peninsula there is little doubt, for both soil and climate seem essentially suited to the cultivation of coffee Of the sugar-cane there are already eight indigenous sorts; and by adopting the terrace system of irrigation, rice might be made to form an important item in her productions. In the open land the cotton-tree (*Bombas pentandrum*) is not uncommon, and the growth of the plant might be attended with satisfactory results. Coconut groves are usually found overshadowing the coast-villages of the peninsula, though, in proportion to the population, who partly subsist upon the fruit, they are generally inadequate to their requirements. In the neighbourhood of Hood Point, however, they are particularly plentiful, hence annual trading voyages are made by the Hood Point natives in the months from October to January to Anuapata, bringing coconuts from the south and sago from the north, which they chiefly exchange for earthenware pottery. In times of extremity they are forced to subsist upon the mangrove fruit.

The race inhabiting the Eastern Peninsula of New Guinea differs materially in *physique* from that peopling the main body of the island westwards. Their colour varies from light yellowish-brown to rich coffee-brown, whereas the pure Papuan about the Fly River has an intensely dark brown skin, but not nearly black—a shade, indeed, similar to the islanders of the Loyalty Group. In stature, the race of the Eastern Peninsula are, as a rule, not so tall, and in disposition are less warlike, but they are endowed with a greater degree of intelligence, that only requires training to raise them from their present lethargy into civilization. It is a notable fact, notwithstanding, that the Papuans appear to possess the art of figure-carving, colouring, and imitation in a greater measure than the more docile race, and it would not surprise me to find, when more is known of them, that but for their cannibal propensities, they are more enlightened than most savage tribes.

It is difficult to draw any positive conclusion as to where the light race of the peninsula first came from, or at what remote period of time such influx took place. That they are not the true aboriginals of the island is as certain as that they are not pure Malays. Their character is entirely different from that of the quiet, apathetic, reserved, and undemonstrative Malay, and though some are of the same yellowish complexion, the great majority are very much darker. The hair of the Malay is black, long, and straight, but in the race we are considering it is black, and sometimes auburn, long, and frizzed, varying in colour, though not so much in form, among the different tribes. Their hair resembles mostly that of the Eastern Polynesians, though it is more frizzed, their complexions are darker, they are more vivacious, and the nose in some is slightly less aquiline.

The construction of their language is similar, in some instances, to that of Eastern Polynesia, several words being also alike, while others are evidently derived from it.* I am therefore induced to believe that the people now inhabiting the south-east portion of New Guinea have in some far distant time made their way thither from *the eastern islands* of the Pacific, residing at various places on their way, until their population becoming too numerous, or from other causes, they or their offspring were compelled to wend their way further westward. On landing, they have driven many of the aborigines from the sea-coast, and, afterwards multiplying in population, have extended their invasion to the interior, until the whole Eastern Peninsula, so far as I have seen and believe, is now peopled by them. Intermarriages between these two peoples must have taken place, and it is the result of this mixture which has placed thereon a race far above the ordinary savage in both physical and moral attributes.

This Papua-Malay race is divided into many tribes, as we find Scotland was formerly into so many clans, each speaking a distinct language or dialect—a circumstance which may be accounted for in two ways. Either they have landed at various periods, or they have lived in such a state of disunion one with another that their languages have ceased to bear more than a faint resemblance to each other, and in some cases none whatever. Of these two theories I am inclined to believe the former. It is impossible at present to say how many tribes the peninsula contains, but if we place the unknown portions against those occupied by tribes whose names and the approximate position of whose country I herewith give, we shall have a total number of nearly twenty, though this would not represent more than half the number of dialects spoken. For its size New Guinea will be found to possess more languages and dialects than any other country, probably, in the world.

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* As in Polynesia, two consonants never come together, but are invariably separated by a vowel. The following examples are some to which I refer above:—

	English	*Motu*	*E. Polynesian*
1	Father	tamana	tama
2	Mother	tinana	tina
3	Animal	manu	manu
4	Death.	mati	mati
5	Eye	mata	mata
6	Woman	haini	vaini
7	Fire	laki.	lafi
8	Arm	ima.	lima
9	Pitcher	uro	uro
10.	To walk	laka.	laka

They are a merry and laughter-loving people, fond of speaking, and loving a joke when not played in a too practical form upon themselves, but are hot of temper and quick to resent a supposed injury, though soon reconciled; and I have known them to bring some trifling present as a sort of apology for any hastiness on their part. They are fairly moral, but by no means modest, clean in their habits, particularly so in their eating, and generally active. They are peacefully disposed towards the white man when they understand his pacific intentions, and soon become attached. The women are not debased, as we find them among the Papuan race, but mix freely with the men, attending to their domestic occupations, and being the reverse of shy at foreigners when they have once got accustomed to their sight. Their skin, unlike that of the Kulkaliga and Papuan races, has no disagreeable odour attached to it, and they are fond of all sweet-scented herbs, with which they often decorate their arms and heads The women are great talkers, taking an active part in every disturbance and discussion of interest, and making the hardest and most determined bargains, so that where the husband fails, his wife generally succeeds When allowed liberties, they do not fail to take advantage, and at Port Moresby, in particular, they are accomplished thieves, inveterate liars, confirmed beggars, and ungenerous to a degree* These are their four worst characteristics, but we found those in the interior, and other visitors from north and south, quite different, though whether naturally so or through fear I cannot say. Whoever the settler, a firm and determined bearing ought to be exercised from the first, so as to prevent the natives from becoming too familiar, as any non-observance of this may lead to serious consequences with unscrupulous white people who would not hesitate to shoot down those who had been accustomed to rank themselves among the privileged Although hasty, the term "savage," as applied to these people, is a total misnomer, for they are neither cannibals, nor possess other degrading qualities which mark most savage tribes.

Both sexes are very vain of their outward appearance, oiling their bodies, and adorning themselves with shell-, feather-, and bone-ornaments, and on all festive occasions each trying to outvie the other in his scanty wardrobe They are friendly with other tribes,† although none feel perfectly secure in the country of another, with what degree of reason, however, I am unable to say, as they always appear to be hospitably treated, judging from those cases which have come under my observation. It is certain that the inland tribe is regarded by the Motu with a sort of superstitious dread, notwithstanding that peace was formally made between them a couple of years ago, as they found it would be advantageous for both. Long droughts, contrary winds, or any calamity such as they might bring about, is often attributed to them.

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* Even if at death's door, for want of food, they would *give* you nothing

† The only exception that I know of is in respect to the inhabitants of Hula (not the whole Kirapuno tribe), who hold the Koiari and Koitapu as their enemies They speared and killed a Koitapu at Papakori (near Anuapata) a fortnight before I left

All the villages of the coast tribes are built so low down upon the beach that, at high-water, the sea flows under the houses, which are consequently built upon poles let into the shingles, so that the floors are from 6 to 10 feet above. These villages may average 4 miles apart, each containing sixty houses, and six inhabitants to the house, the distance between them varying from one village in 30 miles to three villages in half-a-mile, which, reckoning the coast-line of the peninsula at 800 miles.* would give a population of 72,000. The inland villages are thinly scattered, and are not so large. The largest we saw did not contain more than fifteen houses, and the smallest only five houses. Dividing the Koiari country into sections of 10 miles square, we might find ten villages in each containing the same number of houses, which, with an average of six inhabitants per house, would give us a population of 600 to 100 square miles, or, taking the area of the peninsula at 21,000 square miles, would give an inland population of 126,000. If this be added to the sea-coast population, it would make the total peninsular population to number 198,000, or nearly ten persons to the square mile.

From the high land surrounding Anuapata, its limestone formation, free as the neighbourhood is from marshy land, comparatively free as it is from mangroves, and open as the villages are to the sea-breezes, one would imagine a healthier locality need not be looked for. This is a mistake, and although I am unable to state the precise cause, yet the assertion is unfortunately too easy to prove. Among seventeen Rarotonga and savage island native teachers, with their wives (making a total of thirty-four), two-thirds of whom had only been located there or in the vicinity one year, and the remainder two and a half years, no less than seventeen deaths have occurred, nine of which took place between December 1874 and November 1875, from fever and ague.† Among those still living, attacks are of frequent occurrence. Speaking of my own small party, after a three months' residence two members suffered from occasional attacks, and in one case rather severely. Roro (Yule Island) has been stated as healthy; it is of coral formation, hilly, and has every appearance of being so: but although I believe it to be more healthy than Port Moresby, yet the mainland opposite is, I feel convinced, less so. An eminent Italian naturalist, after a residence of some months upon the island, told me his health had not suffered, but his assistant had nevertheless been obliged to return to Europe in consequence of ill-health. Two gentlemen who since landed there, were after a three months' residence so altered in appearance that at first I scarcely recognised them.

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* This does not allow for numerous minor indentations.

† The deaths among the teachers on the islands to the west of the Gulf have been as nearly as possible in the same proportion (17, I believe, out of 31), exclusive of two couples murdered on Bampton Island. It would be well to verify these statistics from the L. M. S., who should be compelled to lay them before future volunteers.

The year 1875 was an exceptionally fine one, but the climate is always very equable. In that year the variation at Anuapata was not more than 7° 40′ between the maximum heat of any month, and 3° 1′ between the minimum heat of the same period. The hottest month was February, the thermometer at nine o'clock in the morning averaging 90° 43′, and the coldest, at the same hour, was August, which averaged 83° 3′, while the average day-temperature for the year was 86° 71′, and night-temperature 73° 5′. The most rainy months were between November and May (exclusive), and the finest between April and December (exclusive). In April, when the greatest rainfall occurred, it registered 8·56 inches, and in November, when the least occurred, the gauge indicated 0·23 inch.

The climate of the interior is more salubrious, but it is impossible to live in the valleys without injuring the constitution, on account of the excessive moisture of the atmosphere. As the morning sun rises above the hills, and pours its glow down into the valleys, the moisture from the rains and heavy dews is converted into vapour, which hangs suspended in the form of white clouds, and it is not until the upper air becomes sufficiently heated that they lift themselves slowly, and gradually disperse. After the heavy rains of the preceding night this was an every-day scene from my camp near Matogorogoro, situated in the district of Munikaira, at an elevation of 1100 feet, by aneroid measurement. It is on this account that all Koiari villages are built as high up on the mountain-tops as possible.*

When a Motu dies, whether man or woman, the deceased's nearest relatives go into mourning. This they do by either colouring the whole body and face black, or only partially so, depending upon what relation they held to the dead person, always adopting the deepest mourning for the nearest of kin. If the mourner is a very distant one, he will merely mark the face with a certain black streak, according to certain codes understood between themselves A man putting on deep mourning will wear a belt and armlets of black cane, and all the coast-tribes I have mentioned adopt a similar system of blackening themselves on such occasions. The blacking used for this purpose is plumbago, or *okor* The Koiari and Koitapu, on the contrary, whiten their faces with ashes on the death of a relation,* blackening them only for the sake of beautifying The Maiva dress themselves in black cord belt and armlets, in addition to which, like the three just described, the chiefs, and those under them who possess one, wear on their heads a dress of black cassowary feathers, placed in such a manner as to nearly obscure the features. The Ilema men put on a wide yellow belt, armlets, wristlets, leglets, and anklets of plaited rattan, and a necklace or *kikita* of small bell-shaped seeds, having a bluish tint. The Kirapuno women wear similar seeds, suspended by strings from the top part of the ear, and necklaces of the same, while I have seen them wearing, in addition, some of the bones of a deceased relative. The latter are either carried beneath the left arm by a string passed over the right shoulder, or else in a small netted bag or *wain*

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* The climate of the interior, no less than its tropical vegetation, reminded me of some parts in the interior of Java.

The graves of the Motu are dug just above the beach, upon the land-side of the village, and fronting the house in which deceased had lived, while over them rustle the leaves of the coconut-trees as they fan to and fro in the breeze When the body is placed in its last resting-place the mourners stand around, wailing, pulling the hair, and smiting their heads seemingly with some violence. It is then covered over with shingle, raised slightly above the level of the beach, and the ceremony is concluded

The number of wives a Motu has is only limited to the amount of his riches, but notwithstanding this, it is quite the exception for a man to have more than one wife, and none that I am aware of have more than three In Ilema it is not uncommon for a chief to possess as many as ten wives, but the Motu women raise such strong objections, that the men generally submit with a good grace. One case happened while I was in their country which illustrates the truth of this statement, wherein a man having, against his wife's wishes, married again, she, in retaliation, destroyed his plantation, and bloodshed would probably have been the consequence, had not the natives, armed with clubs and spears, prevented it. On that occasion the women, also armed with impromptu logs of wood and stout poles, took a leading part, their shrill voices being heard above the excited tones of the men. Few men over twenty years of age remain single, and both sexes are nearly equally represented, though, as a rule, their progeny is not numerous. Some of the younger women are remarkably pretty, but after matrimony they soon lose their beauty, and when old their features become wizened and unattractive. The men carry their age better, but the oldest would scarcely exceed sixty years. The following articles, or some equivalent for any among them that he does not possess, are necessary to induce a father to part with his daughter in matrimony to the donor: 1 dog's-teeth necklace, or *dodom*, 1 pearl shell, or *mairi*, 1 pig, or *buruma*, 1 nassa-shell necklace, or *tantan* (6 folds), 1 stone tomahawk, or *ila*, 1 white cone-shell armlet, or *toia*, 1 spear, or *io*, and 2 women's girdles, or *ramis*, made from the sago-palm, and coloured.

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* The Kulkaliga, and I believe the Papuans, do likewise

Excepting while the Motu canoes are absent on their trading voyages, dances, or *mavarus*, are almost of nightly occurrence among the unmarried of both sexes. They take place on the beach in front of the chief's house, commencing at dusk and sometimes continuing until dawn, more particularly so during the few nights following the safe return of their friends and relations. Moonlight nights are preferred, as no fire or other artificial light is burnt at such times. The dances vary in character, but all are conducted with order and propriety. On great occasions the children seat themselves around a cleared space, while the grown-up men and women stand behind to witness the performance, and the chief with some of his friends look on from the verandah of his house. Each man carries a drum, all accompany the sound by a monotonous chant, keeping wonderful time with their bodies as they go through a series of figures like those of a quadrille. Etiquette forbids the married people from taking part in these recreations. None of the Kirapuno women are, however, allowed to dance, but the motions of the married and single men are charmingly graceful and pleasing. Each carries a drum, which he sways from side to side, or above the head, accompanying it by the voice and the movement of the limbs, the evolutions employed resembling those of a ballet. The Motu are very fond of singing, and when in their canoes their voices, mellowed by distance, may be frequently heard.

Having given a few leading characteristics concerning the Eastern Peninsula of New Guinea, and those of its people with whom I came in contact during a three months' residence in that country, I would take the liberty to conclude by a few words respecting its colonisation.

The climate of a country proposed to be annexed may exercise an important influence in guiding any decision respecting it. I have already given certain statistics which are not encouraging, but the deaths alluded to, it will be noticed, are confined to the coloured natives of Polynesia. They having resided longer in the peninsula than any white man, such a result would be natural, but the percentage is enormous I am inclined to think, nevertheless, that Europeans can withstand the fatal effects of tropical illnesses caused by change of location better than most dark races, and that, consequently, in localities where the latter die the former might only have a passing illness But although the climate of its coast cannot be called healthy, that of the mountain-tops further inland would, I feel convinced, be found otherwise, and it is there principally that the labours of the cultivator would be best repaid But even along the sea-coast I do not think that much need be feared so long as proper precautions are taken in the manner alluded to elsewhere.* The west of the Gulf is decidedly unhealthy, though high land healthy localities may perhaps be found 200 or 300 miles in the interior, by means of the Fly River, and due north of the Gulf at a considerably less distance, but these remain to be proved

So far as trading is concerned, it is certain that the natives have at present no article the export of which would offer sufficient inducements to tempt any Colonising Company to settle on the peninsula with a pecuniary motive in view. Tortoiseshell does exist, but I should doubt if there was so much as half-a-ton weight in the entire area Precious minerals may and probably do exist among the high mountains to the north, but gold is quite unknown to the natives, and no signs of any were met with by my party Ebony and sandal-wood likewise remain to be discovered, while some of the finest timber in the world is only waiting for hands to work. The land would have to be purchased from the natives; and any refusal to sell to such a Company would probably lead to serious consequences, and change their present feelings into those of hostility. From numerous inquiries and my own observations I believe that pearl-shell, if found at all to the west of the Gulf, will not be found in sufficient quantities to pay, while tripang (*bêche de mer*), though found on the reefs to the south, is not over-abundant

That the inhabitants themselves are sufficiently intelligent to wish for further enlightenment I quite believe, but to effect this change too much care cannot be exercised. Any large or sudden influx, without its motive being perfectly understood, would either be resisted, or else drive the inhabitants from their own homes and plantations into the interior, only to result in their extermination, like that steadily taking place among the aborigines of Australia. Such a system as that referred to among a superior and not unfriendly race must, at all events, be avoided, for her inhabitants are already too few. Of all modes of colonisation among an untutored people, I conceive that to be the best which is attained by peaceable means, that which raises them into a sphere of contentedness and usefulness, which, while not permitting insubordination, yet exercises gentleness, which, though governing, yet allows her subjects—whether black or white—to have an interest in that government. It has been contended that the Dutch system is one of oppression, if not of slavery, but I am blind to see that either of these exist in a government which obliges an indolent people, even though at first against their will, to become tillers of the soil, whereby they are created useful members of society, find themselves more contented, possess better homes, and *all are benefited.* Such is the case with eighteen millions of Javanese, and a system that can accomplish this end is not one to be lightly looked upon.

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* Sheet No 34.

[Mr. Stone's Paper will appear entire in the 'Journal,' Vol. xlvi.]

2. *Remarks on the Natives and Products of the Fly River, New Guinea.*

By Signor L. M. D'Albertis.*

The excellent accounts published of the visit to the Fly River in the *Ellengowan* by Mr. Macfarlane and Mr. Chester leave, as far as regards the descriptive appearance of the country, little for me to write upon. I therefore shall confine my remarks principally to the natives and animal life seen by the Expedition, as far as my limited time would enable me to observe. I will give my own impressions, leaving to future travellers, who may have more time, the opportunity of adding to, and completing with probably greater accuracy, the observations I made. I will first relate my observations on the natives of Katau, a village situated at the entrance of a small river or creek at New Guinea, almost opposite to Cape York. The object of our calling at this village was for the purpose of obtaining the company of an old Chief, Maino, who was to act both as interpreter and pilot during our proposed visit to the Fly River.

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* Extracts from letters to Dr. Bennett of Sydney, published in the *Sydney Morning Herald*, March 1876.

We landed at the village in the afternoon of the 2nd of December It was composed of four large houses only These habitations are remarkable for their great length, and each has accommodation for a number of married people The houses are built on piles, and the floor is upwards of 10 feet from the ground, and not far distant from high-water mark The houses have two frontages, and two entrances, opening upon a small verandah, where the natives are in the habit of sitting, or employing themselves in various occupations, or in conversation Two wooden ladders communicate with the verandah, and are in make superior to any I had seen before in New Guinea The people, houses, and village are kept in a very dirty state, and the interiors of the habitations were also in a similar condition, and from there not being any other openings to these extensive houses than those before mentioned, and from being in a smoked and dingy state, a visitor entering them would have to get his eyes accustomed to the darkness before he would be capable of distinguishing the objects or persons inside Many families inhabit these houses, and to every family there belongs a small compartment where they cook and sleep These houses resemble those used by the inhabitants of the north-western part of New Guinea, and the resemblance is still more striking to the traveller when he observes a trophy of skulls suspended near the entrance

About forty men came to meet us on the beach, and at the same time the verandahs of the houses were crowded by women and young people None of the men approached us armed, but we soon afterwards discovered that they had bows and arrows placed behind a house ready for any event that might happen I certainly cannot see any harm in their taking these precautions, as it is very probable they have found out by experience that white people are not always to be trusted, still I do not consider they would keep strictly on the defensive, if they knew that anything was to be gained by taking the offensive As soon as they saw that we had discovered their concealed weapons, they removed them in great haste to some other place Some of the carved ones attracted our attention, and we were desirous of purchasing some of them, but they refused to sell any In spite of their diffidence and reserve we remained several hours on shore, visiting the houses, gardens, and the burial-ground

The plantations were well fenced, and yams, taro, and bananas were under cultivation, and coconut-palms were also abundant. The burial-place was situated a short distance from the village, and close to the beach. We observed on the graves a quantity of provisions placed, consisting of bananas, coconuts, and also an old bow and some arrows. A strong fence had been erected round the graves, to protect them from any intrusion The coconuts were empty, but the bananas were left untouched, most probably because as yet they were not sufficiently ripe I may remark that the natives far west also adopt the custom of placing provisions and arms on the graves of the dead When mourning for the dead, they paint the whole of the body of a white or yellow colour, whilst in the east of New Guinea the natives for a similar event paint themselves with black. At this place some peculiar adornments are adopted by the women, in addition to the painting, consisting of an ornament made of fringed strings of grass or fibre, which they wear over the arms and legs below the knee, and a little above the ankle, but what imparts to the mourning women a remarkable appearance is a strange dress worn by them on this occasion, made of a bundle of small ropes, through which the head is passed, and extending over the body to the knee, and then fastened by a cord round the waist

I observed that the natives use wooden pillows when sleeping, which were generally formed from a portion of the root of a mangrove-tree, and cut so as to stand upon four legs Among some of the pillows I observed one made in the shape of an iguana lizard, the head and tail of which was rudely carved, another was formed like a human head attached to the body of a reptile, and bearing some resemblance to a sphinx The food of the natives appeared to consist principally of yams, sago, taro, coconuts, and an abundance of fish and turtle The women wear a scanty covering, but the men are entirely naked

The men are tall, of spare habit, with long arms and legs, but the body short Among the women I saw many who were tall, with not very prepossessing features, but they appeared to have great muscular power The colour of their skin is generally of a dark copper colour, but I did not observe any so black as the natives of Cape York, or of those of Tauan or Cornwallis Island Their hair is frizzled and woolly, and often short. I examined some whose heads had been shaved, and perceived that the hairs are equally distributed over the scalp, and do not grow in tufts, but as soon as the hair commences to grow it assumes that peculiar tufted appearance which would readily deceive a superficial observer.

It would be difficult to decide which type predominates among them, so many are the individual varieties I have seen some closely resembling the natives of Cape York, others similar to the Eastern race, and consider it probable that there is also a mixture of the Papuan race among those inhabiting the western part of New Guinea. I am more decided in my opinion when I observe not only their physical features, but also that the natives of Katau resemble the Western people in the mode of constructing their houses, using the bows and arrows in preference to the spear, they have also two skin-diseases peculiar to those people, named by them "Bento" and "Cascado" Also, like the Western people, they maintain the practice of hunting for heads, preserve the skulls of their enemies, and keep them suspended in their houses. They also adopt the same custom of preserving the lower jaw separate from the skull, and ornamented similarly to that which I have seen done by the natives of Orangerie Bay, on the south-east coast I could not, however, ascertain if they use the lower jaw as an armlet similar to that people If this could be proved, my opinion would be strengthened that the Katau race have intermixed with the Eastern people.

In a few of the islands in Torres Straits there resides a peculiar variety of the so-called Papuan race, distinct from the inhabitants of other islands in the Straits. The largest island inhabited by the peculiar variety I have alluded to is Darnley Island Many of the people of Katau have similar physical characters, so I consider it would be a task of some difficulty to discover the original type, for it has evidently been destroyed by the intercourse with other races

Among the boys I did not observe such protuberant abdomens as is usually observed among these races The boys appear to be more numerous than the girls, but probably the latter, being more timid, did not like to appear before strangers

On the 7th of December we were at anchor opposite to a large village on Kiwai Island, about 25 miles from the entrance of the Fly River The inhabitants of this village are on amicable terms with those of Katau, from which village two canoes had followed us by another route, arriving the day previous, and informing the natives of our intention to visit them Many canoes came out to us from the village, they are very long, with a single outrigger, light, and only supported by two arms. Several of the natives came in them to trade, bringing coconuts, bananas, yams, and mangoes. There were no women or children with them They were all perfectly naked, but were ornamented with armlets and belts made of grass or rattan. They have, similar to the natives of Katau and other islands in Torres Straits, the helix of the ear pierced, and the lobes artificially elongated, and also perforated and decorated, as well as the helix, with tufts of ornaments, made of grass and dyed of a red colour. I saw some of them who had the lobes of the ear extending to 2 inches in length. They were not armed, but their weapons are bows and arrows; they have also knives and tomahawks of iron, which they procure from the natives of Katau, and also from some of the islands in Torres Straits, who are kept well supplied with these articles by trading with the vessels engaged in the pearl fisheries.

Opposite Canoa Island, about seventy miles from the mouth of the river, there are some large villages and a numerous population. Although on our first approach the natives displayed a hostile feeling, and advanced boldly to attack us, yet, by the exercise of a wise policy towards them, and showing our power without inflicting any injury (except we had been compelled to do so for self-preservation), we succeeded in reconciling them, and we became very friendly; it terminated in a number of canoes coming to the steamer, several of the natives coming on board and remaining several hours, regarding with great interest and curiosity every object that attracted their attention; they asked questions, and replied to any made to them through Maino, who acted as interpreter, making use of the Kiwai language.

From the anchorage not more than two houses of the nearest village were visible, one of which was estimated at about 500 feet in length; and a little behind the edge of the bank we could discern coconut-palms, banana, and breadfruit-trees, growing abundantly about the village. On the top of one of the latter trees I observed the red feathers of the bird of paradise (*Paradisea raggiana*) suspended from a branch, which I suppose was placed there as a decoy to attract those birds to the snares placed for them by the natives, or to bring them within reach of their arrows, as is the custom among the Aru islanders.

The chief of the village also came on board. He was a fine-looking man, and seemed very intelligent; he conversed freely, moving actively about, and laughing; although I did not think, in spite of his cheerful manner, that he had dismissed his fear at being amongst a strange race of people, yet he seemed very much gratified at receiving so much attention and kindness, and at being such an object of curiosity. He accepted everything given to him, but never asked for anything. From the natives that came on board, and from those I observed in the canoes, I made notes of their physical appearance. They bear a great resemblance to the people of Kiwai, but are a little lighter in colour and more slender in form. I saw some resembling Arabs. Their average height is moderate, the head comparatively small, the forehead depressed and sloping backwards. I observed so uniform a resemblance among them as to lead me to come at once to the conclusion that they must either intermarry among themselves or among a people of a similar race. What are they? is the question If we take as a type of the Papuan race the inhabitants of the north-west part of New Guinea, I do not consider they belong to that race, but they may be considered as approximating nearer to those of the south-east part—at least as far as we have had as yet an opportunity of observing those living on the coast

I met natives who were on a visit at Yule Island, who came from Cape Possession, and closely resembled them However, I do not believe they are a pure race. In common with the two races of the East and West, many customs, &c., showed that they participate in the two races. They have, similar to those of the North, the hunting for heads, and the construction of their habitations, although at this place there is a slight difference in them, for here the houses have as many openings in them as there are inside compartments. Similar to those of the West, they build their canoes in the same manner, wear a head-dress made of the plumes of the birds of paradise, a heavy wooden belt, and a breast-plate of mother-o'-pearl shell Peculiar to themselves, I observed a helmet very skilfully made with rattan and cord, also a piece of white shell used as a portion of their war-dress, and worn over the pudenda But that which was most peculiar to them, and new to the ethnologist, was the method adopted by them of preserving the heads of their enemies.

In the North, as is well known, the natives are of a very ferocious character, and very active head-hunters, but preserve only the skulls At Katau the natives also hunt for heads, and preserve the skulls, at the same time separating the lower jaw, which is said to be used occasionally as an ornament. But these people do not only hunt for and preserve the skulls, but they are in the habit of adorning them with great skill, and this process is, as far as I have observed, quite novel in New Guinea, although I believe the practice is adopted at other islands east of New Guinea

After the skulls have been perfectly cleaned, they cover them with a mask, formed from a preparation of wax, probably mixed with some resinous material, the mask extends from the upper part of the forehead to the roots of the teeth of the upper jaw. The upper part of the mask is adorned with the bright red seeds of the wild liquorice vine (*Abrus precatorius*), and the outer edge is adorned by plaited stripes of rattan. The eyes are represented by two small species of the cowrie shell, or a black seed also surrounded by the scarlet seeds of the *Abrus precatorius;* from the zygomatic process of the temporal bones two long fringed ear-pendants are suspended similar to those generally worn by the natives. The lower jaw is strongly fastened behind to the zygomatic bones, and in front by small rattan cords from below the symphysis of the chin, passing inside the nasal passages In this way the lower jaw is secured to the upper To this is attached a loop of plaited rattan, two feet long, which is used as a handle This loop is secured to the skull by a transverse stick of hard wood, passing behind the two condyles of the lower jaw, and in front of the foramen magnum. In removing the mask from one of the skulls, I found the orbits were almost entirely filled with lime, and the long thorn of the sago-palm was inserted in the optic foramen To give support, strength, and the required length to the nose, a piece of rattan is ingeniously used, and the distension of the nostrils effected by the insertion of sagu-thorns and grass The interior of the skulls was found partially filled with stones, hard seeds, pumice stone, and kept in by dried grass When held by the loop and swung about, a loud rattling noise is produced, and we infer from it that they are probably used in their dances

The weapons used by these people are bows and arrows The bows are about six feet high, the arrows vary very much, some are pointed with hard wood, others with bamboo, bones, and a few with the long nail of the cassowary It is said that some of the arrows are poisoned, and I believe the statement, which was also confirmed by Maino, and from the following fact I asked the natives to sell me some of their weapons, and they readily did so, but when I wanted to purchase one pointed with bamboo they refused, until I offered so high a price that they could not resist the temptation, and then handed it to me with the greatest care, so that no one should be touched by the point, which appeared to be smeared with some preparation of a reddish colour As far as I could ascertain by signs, I understood them that some were poisoned but not the others

They always carry with them a bamboo knife, which is used for severing the heads of their enemies They do not usually keep it sharp, but when required they sharpen the edge with a shell (a fresh-water species of *Cyrena*), which is always carried for the purpose, attached to the knife They have also a kind of dagger, formed from the thigh-bone of the cassowary, the handle of which is tastefully adorned with the red seeds of the *Abrus precatorius* The dagger is used to despatch the wounded man, and then the bamboo knife to cut off his head

The *worthy* Maino, who, according to his own confession, had cut off thirty-three heads himself, gave us a full and minute description of his mode of operating It was thus when the victim was dead, the skin and muscles of the neck were cut through, then grasping the head with both hands, it was forcibly inclined from one side to the other, and then by a powerful twist the bones of the neck were dislocated, and by a little further aid from the knife the head was off. To give us an illustration how it was done, he acted fictitiously on a man on board.

The further the traveller advances into New Guinea, the greater the difficulty is increased of enabling the anthropologist to solve the problem of the Papuan race, and I do not consider that we shall be able to come to any conclusion respecting them until more of the interior has been explored, for short visits to the coast will not serve the purpose, and also until we have become acquainted with their language, as well as made a comparison of the skulls of the various races I am aware that some anthropologists do not place much dependence solely on the skulls, still it has been found of great assistance in some degree of determining the various races.

On the 14th of December, we were 150 miles up the Fly River, the furthest point reached by the *Ellengowan* Not far from our anchorage, I found the ruins of an old village composed of five houses, they were from 30 to 40 feet in length, and from 15 to 20 feet wide, they were constructed of the trunks of small trees, and had been covered with palm-leaves, the floor was only a foot and a half from the ground, a trench 2 feet wide and about the same in depth had been dug all round the habitations for the purpose of draining them, a most remarkable and novel proceeding for New Guinea. Close to the village I observed some wild bananas growing, and a grass, called "Job's Tears" (*Coix lachryma*), the seeds of which are used generally in New Guinea for making necklaces and other ornaments

This ruined village was so far distant from the last natives we saw that I am inclined to consider that it had been inhabited by some of the natives of the interior The general appearance of the country on the borders of the river was that of low swampy islands, formed by a large delta, some old, and some more recently formed by the mud brought down by the floods, or the natural flow of the water some are evidently in a state of formation, while others are disappearing, being washed away by the current This, I expect, will be the fate of Canoa Island, which had very recently been severely injured by a hurricane, destroying a large number of trees, and its banks can almost daily be seen to be washed away by the floods and currents The relative age of the different islands may be estimated by the rich or poor vegetation seen upon them. Here the wild nutmeg and the gigantic fig-trees are seen in fruit and luxuriance of foliage, attracting the fruit-eating pigeons (*Carpophaga*), the red bird of paradise (*Paradisea raggiana*), Hornbills (*Buceros ruficollis*), and other species of frugivorous birds in great numbers. At another part the Candle-nut-tree (*Aleurites*), and several species of Kanary nut-trees (*Canarium*), on the fruit of which the great palm cockatoos (*Microglossus aterrimus*) feed

Where the jungle is not so dense a small bamboo grows, and is a place of resort for the Megapodius and Talegallus, being suitable for their food and the construction of their nests Where the forest is more dense it is difficult to penetrate from the entanglement of the vines, and that strong-growing climbing palm (*Calamus australis?*) which throws up shoots of great length covered with sharp spines, and long tendrils similarly armed, ascending to the tops of the tallest trees At this place we observed the Racquet-tailed kingfisher (*Tanysiptera dea*) frequently seen darting with a heavy dash upon a beetle or some other insect, while the beautiful king bird of paradise (*Cincinnurus regia*) may be seen climbing on the vines, displaying the bright tints of its splendid, rich, and varied colours to the bright rays of a tropical sun as it occasionally penetrates the dense foliage of the trees

The splendid and rare kingfisher (the *Halycon nigrocyanea*), and another kingfisher (the *Ceyx solitaria*), are heard uttering their piercing notes by a rivulet in some secluded nook

When the trees are more lofty but not so overgrown by vines, the large and noble-crested pigeon (*Goura sp*), the size of a turkey, is often seen walking very majestically about, seeking for the fruits and seeds upon which it subsists, and on the top of the loftiest trees the magnificent red bird of paradise (*Paradisea raggiana*) is seen displaying under the bright sunshine its rich and beautiful plumage, or endeavouring to excite the attention of the unadorned female from its elevation out of the reach of the arrow of the natives or the gun of the naturalist, but the king of the forest here is the cassowary, the footprints of which are to be seen in every muddy place, mingled with the hoof-marks of the wild boar The night at this place is disturbed by a variety of strange noises, and probably still stranger animals, whilst at the early hours of the morning we are awakened by the piercing cries of numbers of lories, honey-eating parrots (*Trichoglossus*), passing over our heads, the latter darting with the rapidity of an arrow. A loud "whock-whock" emanates from the unmusical throats of the birds of paradise, and the peculiar prolonged loud and shrill, but mournful, whistle of the great palm cockatoo (*Microglossus aterrimus*), and the drum-like noise of the cassowary, with the notes of numerous other birds, vary the woodland sounds. The scenery, if not very bold, was interesting for its novelty, and it was almost impossible to resist a kind of fascination produced by the wildness and novelty of our situation

It is difficult to express the feeling of the explorer on anchoring in a new place up a river a little before sunset, when every object appears before him wonderful, novel, and interesting, and which, on the approach of darkness, assumes a fantastical appearance, especially when millions of fireflies are seen flitting about in all directions, their lights reflected in the clear smooth water, increasing the luminosity to nearly double I may mention here that when at anchor at Kiwai Island, early in the morning, and a little before sunset, thousands of the black and white pigeons (*Carpophaga spilloroa*) were seen, as at Yule Island, going from the east to the west to their roosting-places, and in the morning would be seen returning from the west to the east, so I consider this species of pigeon to be almost as plentiful in this part of the world as the American passenger pigeon (*Columba migratoria*) is in North America

My curiosity was very much excited by Mr Stone's discovery of a very large bird of flight, the footprints of buffaloes on the Baxter River, and by reading in 'Nature' of the discovery of the dung of the rhinoceros in New Guinea by Captain Moresby I do not allude to the imaginative fauna of a Captain Lawson, because the more real discoveries of Captain Moresby and Mr Stone are amply sufficient to excite the most sanguine hopes of any naturalist But alas! I was doomed to disappointment, and found it a delusion, for I found the fauna very poor, considering the character of the country and the vegetation. I could not get a glimpse of the gigantic bird with a spread of wings of 22 feet, but very considerately reduced by Mr. Stone to 16 feet, nor was I fortunate enough to see the dung of Captain Moresby's rhinoceros, or the beast itself, nor the footprints of the buffaloes I think I did, however, see the bird mentioned by Mr. Stone, and I have also seen common heaps of dung so large as to make me wonder when I first saw them With respect to the large bird, from what I have heard from more than one person who was up the Baxter River, I can safely reduce it to the moderate size of the red-neck hornbill (*Buceros ruficollis*), probably in the excitement for novelties, two or three birds starting in flight at once may have been magnified into one The flight of the hornbill is very peculiar, being slow and steady, with the noise of a locomotive engine The noise made by the bird in its flight was at first recognised by some on board as that of the huge bird seen on the Baxter River, and then the colour of the bird decided the question, although it has already been reduced to 16 feet, I am obliged to reduce it to about 4 or 5 feet

With respect to the dung seen by Captain Moresby, I may remark that a stranger observing for the first time the dung of the cassowary, and not having the experience which he would have when resident for some time in the country, would never suppose it was produced by a bird, in one of these heaps I have counted upwards of forty-three almost undigested seeds of the fruit of the pandanus It is certainly a matter of surprise the size of the heap of dung deposited by that bird in the wild state

I think it will be interesting to mention that in this part of New Guinea (nearer to Cape York than Hall Sound), I observed that the flora and fauna are more decidedly Papuan than at Hall Sound, although the latitude is almost the same A number of the species of birds I procured are denizens of New Guinea only, and here I did not see a single *Eucalyptus* or gum-tree, whilst at Hall Sound I have found species of birds common to both Northern Australia and New Guinea, and there I found at least two species of the *Eucalyptus* very common, as well as many of the North Australian plants Thus, judging from the flora and fauna of the Fly River, it evidently shows that this part of the country is more allied to the north-west part of New Guinea than to the eastern portion

On the 15th of December we were compelled to return, from being short of provisions, to my great regret, just at the time that my expectations were raised of being able to penetrate into the interior, but I hope at a not far distant time to be able to carry out this desire I cannot conclude without tendering my grateful thanks to Mr MacFarlane for giving me the opportunity of visiting the Fly River, and for many other acts of kindness and assistance.

The Rev WYATT GILL said he was the first European to ascend the Manumanu River, and his observations in regard to the neighbourhood, and the character of the people, entirely agreed with those expressed in the Papers to which they had listened Mr Stone was quite right in saying that the women there were indeed the "better halves" They appeared to him to have more intellect than the men. The natives were very pleasant people to live among, but he was sorry to hear such an account of the unhealthiness of the climate, for it was he who took some of the teachers there He had hoped that ere now a healthy locality would have been discovered, where not only native teachers, but Englishmen might take up their abode, and make it the starting-point for opening up the country, and developing its resources. Signor D'Albertis's Paper was a very interesting one He could not help feeling a little mortification at finding the wonderful bird reduced to so commonplace an affair, but he had some comfort in knowing that his own report two years ago of finding a cuckoo in New Guinea was not a myth. In order to get into the interior of New Guinea, he thought the Fly or the Aird River must be ascended, and he had no doubt that the pluck of Signor D'Albertis and Mr MacFarlane would, in a few months, enable them to penetrate into the real interior of the land Whatever might be the character of the South-east Peninsula, it was, after all, but a very small portion of the island He could but hope that there yet remained to be discovered in the table-land of the interior some spot which might be advantageously cultivated by the natives, under English superintendence As an Englishman, he was not ashamed to say that he trusted the day would come when the flag of Great Britain would wave over the eastern part of New Guinea. At the same time he thought it premature to take any active steps at the present time to colonise the country. It was highly desirable that there should be a right understanding with the natives, and he believed the day was coming when, like Fiji, New Guinea would voluntarily place herself under English rule

Captain F J EVANS, R N, believed that until the series of rivers, the mouths of which had been discovered by the *Fly*, were ascended, it could not for a moment be pretended that anything was known about New Guinea He thought those who had advocated the colonisation of the south-eastern part had lost sight of one or two facts If a settlement were now placed there, it would be practically cut off from the rest of the civilised world The colonists would be 3000 miles from Hong Kong, 1500 from the Dutch possessions, 1500 from Sydney, and more than 1000 miles from the nearest British port for obtaining supplies furthermore, sailing-ships would be able only to traverse those seas at certain seasons of the year, it would therefore be a most expensive affair for any settlement in such a position to have communication with the outer world It was certain that the country produced but little, and whatever the colonists required to live upon would for a long time have to be brought to them That was a matter which had not been properly considered in the projects of colonisation which they had heard of, but it appeared to him to be one of serious import His own belief was that whatever we should know about New Guinea for a long time hereafter would be ascertained by the exertions of the missionaries, or those gentlemen who visited the island for the purposes of science

Mr JESS YOUNG said he had been very anxious to organise an expedition to explore New Guinea, but everybody seemed to throw cold water upon the scheme, and he could not at present raise funds sufficient to carry out his project He had intended to start from Somerset to the Fly River, but he had heard that night that he had been anticipated by Mr MacFarlane and Signor D'Albertis His present intention was to go along the coast westward from the Baxter River and see if he could discover the mouth of another large river in that direction. Such a river must exist, having the mountains in the western portion of New Guinea as its watershed, and if he could find that river and follow it up, he would in all probability succeed in getting into the centre of New Guinea

Dr MULLENS said he had received letters from the Rev Mr Lawes, the missionary resident at Port Moresby, who accompanied Mr. Stone There were two other gentlemen who went with the Expedition, and who had been connected with the Macleay Expedition, which was broken up Mr Lawes, in his letter, said.—

"The village of Omani is picturesque In front of it are fruitful valleys, in which are such plantations as we never see at Port Moresby. Several streams of water are in sight—their course marked by a foliage of deeper green In these ravines, between the hills, are well-fenced plantations of sugar-cane, taro, bananas, &c The village itself is at a height of 500 feet above the level of the sea

"On the other or inland side is a valley, and then a high steep mountain, rising about 600 feet, and just beyond it, on one side, is Mount Astrolabe, the highest in this part

"We were, of course, a great wonder to the people, our white skins, our clothes, our guns, our hatchets, &c, all came in for a share of admiration The natives borrowed a small American axe, and began to cut the trees down for amusement

"About 10 o'clock we were ready for the ascent A lot of Omani people went with us, and we were soon puffing and blowing in the blazing sun. The path was very steep, and in some places very narrow and dangerous. It was no joke, going up a narrow path, at an angle of about 60°, with a precipice on one side of it and a burning sun overhead However, we got safely to the top at last, as wet as though we had come through a river And what a splendid view there was when we reached the top! I did not dare look down before. We were 1100 feet above the level of the sea Before us was a fertile plain about seven miles broad, with many streams running through it, ending in the village of Tupuselei, beyond it the sea, the bays and harbours along the coast, visible as far as Port Moresby on one hand and Round Head Point on the other On our right, hills and mountains piled up in all sorts of shapes and heights On our left hand Mount Astrolabe rose above us quite close, and apparently not much higher At the back was another plain with two rivers, or rather two branches of the one river Laloke, running through it. Behind Mount Astrolabe is a range of altogether a different character, the side towards us being perpendicular rocks exactly like the cliffs of an iron-bound shore. Altogether, it was one of the finest panoramas I have ever seen

"At last we saw the houses Two of the natives, with the teacher, went on first to prepare the people for our arrival, lest they should run away. The village is 1000 feet above the level of the sea, has some six or eight houses in it, and is called Palunu, although Munikaihila seems to be the general name of the district We were not yet at our destination, for the principal village is a few miles further on, on a higher peak of the same mountain The chief, Boloko, was confined to his house with a bad foot I went to see him, and gave him a present I told him we wanted some food, taro, sweet yams, &c, for which we would give him beads, but he said they had nothing but sugar-cane

"The view from this village is very grand Just opposite to us are two waterfalls, small now, but after rain they must be grand All around, as far as the eye can see, are mountains and hills of all shapes and heights—not an acre of level ground The plantations of the people are on break-neck slopes. All is covered with trees, up to the very summits of the mountains

"Mount Owen Stanley rose as a grand background to the panorama, and could not have been more than twenty miles off in a direct line. We were now fairly at the back of a very picturesque and peculiarly-shaped mountain, which had been visible at times ever since we left Port Moresby It is seen from the mountains there, and from its peculiar shape is a striking landmark. It has a lofty semi-detached peak at one end, and the different aspects of this are very fantastic and strange It is from 800 to 1000 feet high The peak is very steep and bare for about 300 feet at the top, below that it is steep, but covered with vegetation, and looks like many mounds thrown up to support the peak On the top of the mountain itself there appeared to be a considerable table-land covered with trees The native name of the mountain is Vetura

"The vegetation all along the road was very fine. The villages here are very clean, they cannot well be otherwise, seeing they stand on a narrow ridge with deep valleys on either side, down which wind and rain carry all rubbish The men were all decorated in full style, and so were the stone clubs, of which we saw plenty The people are a fine race, but appear mixed They are, perhaps, darker a little than the coast-tribes, but are much lighter and in every respect different to the Papuans The highest point to which we had gone was 1400 feet We reached Momeli in the afternoon In the evening the teacher and I went into the bush, in quest of the goura or crested pigeon It is the most splendid bird I have ever seen We succeeded in shooting one It has a magnificent lilac-coloured crest, and is as large as a medium-sized turkey The colour of the feathers was very delicate and beautiful, much more so alive than dead We reached home about 12 o'clock on Friday, the 10th of December, none the worse for the forty or fifty miles' tramp over new ground in the interior of New Guinea."

The PRESIDENT concluded by saying that he remembered some two years ago, when the subject of New Guinea was first brought forward, expressing some apprehension about it He said that hitherto, when threatened with the exhaustion of all material for the consideration of the Geographical Society, he had been accustomed to fall back upon New Guinea as a sort of *pièce de résistance*, but that, in consequence of the present exploratory development, he had feared that that *pièce de résistance* would be very shortly consumed From the experience of the last two years, however, he was rather reassured on that subject, for, after all that had been done, only the outer crust of the island had been penetrated—nothing more, in comparison with the whole island, than the rind of an orange compared with the core At the same time there could be no doubt that Europeans would gradually press further into the interior, and as they became better acquainted with the natives, would find their way up into the mountains That was the real field which would reward some adventurous explorer—some New Guinea Cameron of the future He would be very glad indeed to see Mr Jess Young launched into the interior of New Guinea, with sufficient apparatus and appurtenances to warrant his undertaking such a journey, but it was undoubtedly an exploration of great difficulty and great danger, and he would counsel Mr Young not to enter upon it in a rash or ill-advised manner With full preparation and full means at his command he might do a great deal, but failure would be worse than no attempt at all. He was glad that on this occasion the speakers had avoided the moot subject of colonisation, which really did not fall within the province of the Society, and could not be discussed there to any advantage, although it would in the future, no doubt, become a matter of great interest and importance The meetings of the Colonial Institute were far more suited to such a discussion than the meetings of the Geographical Society

In conclusion, the President announced that the Geographical soirée would take place on Saturday week, not in Willis's Rooms, as in former years, but in the Indian Museum In their arrangements for a soirée on this larger scale, the Council were receiving great assistance from Mr Cunliffe Owen and his subordinates of the Department of Science and Art at South Kensington The Anniversary Meeting would take place on Monday, the 22nd instant, when the Medals of the Society would be handed to the gentlemen who had been selected to receive them The Royal Medal for the encouragement of Geographical science and discovery had been awarded to Lieutenant V L Cameron, R N., for his journey across Africa from Zanzibar to Benguela, and his survey of the southern half of Lake Tanganyika the Victoria or Patron's Medal to Mr John Forrest, in recognition of his services to Geographical science by his numerous successful explorations in Western Australia, and especially his route-survey from the Murchison River to the line of the Overland Telegraph The Medals would also be distributed to the successful competitors for the Schools' Prizes. In the evening the Anniversary Dinner would be held at Willis's Rooms, at half-past six o'clock, when he hoped that the Fellows of the Society would attend in great numbers, as the occasion would be one of peculiar interest.

ADDITIONAL NOTICES.

(Printed by order of Council)

1 *Itinerary from Debbé to El Obeyad, on the Upper Nile, with details of places of most importance, after the Survey of Staff-Colonel R E Colston.*

[Communicated by General STONE, Chief of the General Staff, Egyptian Army *]

DEBBÉ, which is the starting-point for caravans for El Obeyad, is a wretched village on the Nile There is perpetual dust, and the heat was already stifling in the months of March and April By Polar observations I here determined the latitude at 18° 6′ 55″

In this place the variation of the compass is from 7° 45′, at Wady-Hamyde it was fixed by Colonel Mason at 7°

During my sojourn at Debbé I wrote out instructions, in French, for the use of the officers of the staff, to teach them to determine the variation of the compass by observation of the Pole Star and the Alioth Star I made them take practical observations, and I had the satisfaction of seeing that they were masters of this subject

I left Debbé on the 20th of April, 1875, so much paralysed that I could not mount a horse without being put in the saddle by two men As soon as we left this town we found ourselves in a most sterile desert After three hours' marching, you arrive at the wells of Bargaguel, excavated by Said-Pacha There are four of them which have a parapet of stones (dug from the bottom of the well), and which are built up in the inside These wells are 40 metres in depth, and there is only one of them which supplies a little water, the temperature of which is 28° 75 C

For the convenience of caravans and herds, it would be necessary to dig wells in the Wady-Abou-Gimri A fresh and vigorous vegetation in the ravines of this Wady shows that there must be water very near the surface.

After marching 71 English miles from Debbé, we arrived at the wells of Bréga They are situated in a plain of hard sand There are a dozen little wells where water is found at a depth of from 3 45 m to 4 20 m

Latitude of Bréga, 17° 15′ 25″

Here I made the soldiers dig a big well of the depth of 5 20 m

The first march from Bréga, you cross a desert, an absolutely desolate plain. There are here several rocky summits, which require a good deal of labour to render them practicable for carriages, but this work offers no difficulty. After fourteen hours of marching, I arrived at the camp of Missalami on the 28th of April

The guides having reported that there were *ruins* a little to the east of the camp, I left the Expedition at the camp, and on the 29th, with Dr Pfund and the officers of the staff, I went to visit the place, which they called El-Kab It is nearly 7 miles due east of the camp of Missalami. The

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* Translated by Colonel J A Grant, C B

"ruins" simply consist of a circular space, surrounded by a wall of stones, without mortar (schist, slates, trachytes), 4 or 5 feet high, and 6 or 7 thick The diameter of the circle is 240 metres This enclosure, situated in a narrow wady, is probably used for beasts, its shape and situation would not suit for a fortification There is not a trace of inscriptions, tombs, or of any work, except three ancient wells, without water, with stone walls Quite close to the Wady Haschin there are six wells of very good water, at the depth of only 4 feet If a carriage-road should be established between Debbé and El Obeyad, it should be made to pass by those wells, as it would not lengthen the road much There were many animals and some Bedouins round these wells

At 12 miles from the camp of Missalami I encamped, on the 30th of April, in the Wady Hassanawi, where there is but one well with very little water, but doubtless more exist

May 1*st*—March of 10¼ miles to the wells of El-Aye This portion of the route would require more labour than any other to make it suitable for carriages, but no serious difficulty exists There are several defiles (*babs*) to cross the rocky summits

The wells of El-Aye are situated in a narrow wady between freestone-hills of from 140 to 150 feet high, measured by the aneroid There are twenty-five of them, in five groups They are dug in a soft freestone, and many more could be made In some of them the water is brackish, in the majority of them it is good. It is found at a depth which varies between 3 m and 7 40 m The temperature in the well is 25° C It is said that it is not more than twenty years since these wells were excavated The surrounding region is quite sterile In this wady a violent wind rages, which fills the atmosphere with sand The natives call it a continual storm, which lasts the whole year, and prevents all attempt at cultivation, covering everything with sand In consequence of this wind, it was impossible to make any correct observations

Approximate latitude 16° 39′ 48″ (?)

Around the wells of El-Aye Bedouins are met with having many beautiful beasts. The greater part of the inhabitants of this district belong to the great tribe of the Kababiches, whose chief is Fadlalla-Bey The inferior tribes here are named Hawawir, which are subject to Dongola, Sawour-ebache, or Seiagab, and Chiliwab, which belong to Kordofan They are all nomads, of bronze complexion, moderate height, and well made Among them there are many women beautiful both in form and face. They say that they suffer much from the incursions of thieving Bedouins, who come from Darfour, a distance of twenty days' march They call these brigands Ziya-diyas, Hommours, and Benigarrar They are also pillaged by the thieves of Gebel-Harraz, called Nobahs

On the 6th of May I arrived at the camp of Geleti, crossing great desolate plains, and here and there hills of freestone from 200 to 300 feet high. A well should be dug in the Wady Geleti, where water would certainly be found at little depth

Between the camps of Geleti and Zarefa are found the first constructions of white ants (*termites*, in Arabic, *arda*), elevated plateau, much wood in the Wady Zarefa, and the Wady Abou-Arouck.

It was necessary to dig a well one hour's march south of Zarefa in the Wady

Further on we came on Gebel-Hossan There is a rocky pass a little higher, which would require some labour to make it easy for a carriage

In the Wady Hobagi there are five wells of 4 metres in depth, almost without water Here good wells should be dug

May 9*th.*—Between the camp Abou-Arouck and the next I saw two of those large birds called hobah, mentioned in the account of Darfour (of very little value) by Cheik Townzi. These birds are a kind of bustard

The route has crossed an immense plain, flat and arid On the right where I camped, in the Wady El-Jundoul, I saw a herd of twenty of the large antelopes called Ariel I called this encampment Camp Ariel.

May 10*th* —Exhausted by great pain, to which was now added the acute suffering of a violent strangury, I could no longer sit on horseback, and I was obliged to stop three hours' distant from Es-Safi; but as it was absolutely necessary to water the camels, I sent on all the Expedition to Es-Safi, only keeping a small escort with me In this camp I remained until the 12th

I resumed the march that day, and at two hours' from Es-Safi I observed the first point of hypogenes rock piercing the surface of the soil. The plain was arid, and covered with little quartz pebbles. I arrived at Es-Safi in a state of exhaustion and suffering which I cannot describe

The wells of Es-Safi are in a large basin, which becomes a lake of little depth during the Kharif, and three or four months after, at the end of the dry season, the soil is cracked like that of the shores of the Nile Here is found an inexhaustible supply of very good water (The name Safi means limpid) Thousands of camels and beasts are watered here daily It is a station of Bashi-Bazouks, commanded by a boulouk-bashi. Altitude of Els-Safi, 1393 feet

Variation of the compass, from the observations of the officers of the Etat-Major, 6° 38′ 40″ (I could not gather sufficient strength to make any observations myself)

I stopped ten days at Es-Safi During this time my malady made such progress that it became very likely that I would not survive till I arrived at El-Obeyad I therefore sent on a dispatch to Commandant Prout, whom I knew to be on the route between Khartoum and Obeyad, to let him know the state of my health, and to beg him to hasten

I set out again from Es-Safi May 22nd It was impossible for me to keep my saddle in consequence of the violence of my suffering and the paralysis of my limbs, which had become almost complete It was therefore on a litter, carried by the soldiers, that I made the journey between Es-Safi and Obeyad I arrived on the 22nd at the camp of Omashechat

Eight miles west of this camp, in a district called Maçarine, are eight wells, containing a great quantity of water

23*rd* —I camped at Goz-el-Han In the wady of this name wells ought to be dug Water would certainly be found

May 24*th* —While I was directing the caravan to the Camp Megour'rha, I ordered Lieutenant Mohammed Effendi Mahe to reconnoitre some reservoirs in the Gebel-Harraza, to the east of the route This officer went there, and rejoined me at night in the Camp of Megour'rha He reports that these mountains (of slight elevation) are inhabited by Bedouins, thieves, No-eban, or Noba There are two reservoirs, which hold water only during the Kharif After they are exhausted, the natives procure water by means of two wells—one called Sania—situated in the mountains They are dug in the rock, and are 10 metres wide and 30 deep They contain but little water, and it is necessary to descend into the well to procure it The second well is called Chongur, it contains a small quantity of good water

It is between Goz-el-Han and Megour'rha that the first fields of doh'n are seen

May 25*th* —I arrived at the Camp of Mekerng, after a march across a burned-up plain All the trees were leafless This arid plain continued during the next day, during which I sent the caravan to Tagmar, but I was so ill that I was obliged to stop near Gebel-Gahamieh

27*th*.—I was carried to Cagmar, three hours of marching across a hard and flat plain, covered with little pebbles of quartz, and without trees Towards the east quartz-hills were seen.

At the end of the dry season Cagmar is a charming oasis in this arid desert. The eye, wearied with the burning sand, rests with delight on what seems to be a great meandering prairie of emerald green. Four months this prairie is a lake, during the rest of the year water is found very near the surface, and can be drawn from 200 holes, which are on the border of the zone of vegetation. Thousands of camels are brought to water daily from the surrounding deserts. As soon as some hundreds disappear, they are immediately replaced by others, and you have continually in view from 4000 to 5000 camels, covering a space of from 20 to 30 acres. Large herds of cattle, goats, and sheep, come to water at these precious wells. Skirting this verdure you see a dozen date-palms, as many doum-palms, and figs. Here doh'n, wheat, cotton, and balmia are cultivated. Myriads of birds of different species, among which the black and white stork predominate, serve to enliven the country.

The inhabitants are the Kababiches, and here is a garrison of Bashi-Bazouks.

June 1*st*.—I left Cagmar, where I had remained five days, and where the state of my health continually grew worse. After a march of 6½ hours, I arrived at Garnaiah, from Cagmar to Obeyad are villages of permanent habitation, surrounded by cultivated fields, and with wells from 15 to 18 metres in depth. The habitations, which are called tokles, consist of a circular wall, formed of mud and cane, from 4 to 5 feet high, surmounted by a conical roof of stubble, formed of the same cane in regular layers. Near these tokles you frequently find protections against the sun, called racoubah, which simply consist of stakes fixed in the ground, supporting horizontal poles, on which they arrange a bed, more or less thick, of mortar. These shades, which are open at both ends, are very preferable to the tokles, because they do not admit rain.

June 2*nd*.—I continued my journey, notwithstanding terrible suffering. I passed by a place between Schougla and Aikab, where they made charcoal and iron. Camped at Grékigh.

June 3*rd*.—I had the comfort of being rejoined by Commandant Prout, who, having received my letter, came to meet me. This same day I camped at Chérème, where are wells of 24 and 25 metres in depth.

June 4*th*.—I arrived at Bara. Here there is a garrison of Bashi-Bazouks under a Sanjiak. It is another oasis, still more rich than Cagmar, and is called the Paradise of Kordofan. At 6 or 8 metres much water is found (unfortunately bad for drinking), and dries at the end of the season, the Sakias and the Chadoufs continually try to irrigate the gardens as on the banks of the Nile. As well as the crops we found at Cagmar, they cultivate all sorts of vegetables, onions, tomatoes, cucumbers, melons, radishes, and even cabbages. You also find citrons, pomegranates, dates, and grapes in the garden. The Sanjak Mustapha Aga had prepared a house, and treated me with the most generous hospitality, but notwithstanding good nourishment, my condition became worse and worse. The paralysis, which had seized my two legs, rose to the hips, and on the advice of Dr Pfund, I made my last will in anticipation of approaching death. On the 8th of June I formally transferred the command to Commandant Prout. The same day we had the first rain of the season, accompanied by thunder and lightning.

June 10*th*.—We left Bara, and camped at Om Soât, passing by villages having wells of from 22 to 25 metres.

June 11*th*.—We came as far as Caffuriout, at 5 o'clock in the afternoon there was a most violent storm, accompanied by very large hail. In two minutes all the tents were knocked down. I was stretched on my angareb under a pelting rain, and incapable of making the least movement. My faithful and devoted servant, Thomas Ferranti, and my orderly, ran and covered me as they best could. For fifty minutes they were obliged to hold with all their might the coverings which sheltered me from the wind and the rain, while they themselves were exposed to the fury of the tempest. After more than an hour they replaced the tents, but mine, although it was fastened by strong cords outside, was torn, and carried away at 9 o'clock at night. This storm gave us a very exaggerated idea of what the rainy season would be, and we expected the same every day, but none which followed could be compared to it in violence.

The following day, June 12th, was my last march. Two hours before arriving at El Obeyad, we passed a little summit of white quartz, called Gebel-Kourbadj, and which rises from 60 to 80 feet above the plain, extending in one direction from east to west. From the summit we saw an immense plain, with some trees extended, and at the horizon rose some stones of quartz, those of Gebel-Kordofan, Abou Senoun, &c. But what at once attracted the attention of the traveller was the *Baobab* (*Adansonia digitata*), which we saw here for the first time. To the north of the quartz peak, there is not one of these trees, but you see them as soon as you have passed it. These trees, by the hugeness of their trunk and shrivelled bark, appear to be the elephants of the vegetable kingdom, one of these, measured by Commandant Prout, was 21 metres 30 inches in circumference, but their height rarely exceeds 14 or 15 metres.

The Baobabs are badly proportioned trees, of a heavy and ungraceful aspect. Their solitary growth at a distance of several hundred metres from one another, and their enormous size, makes them very salient points in the landscape, in spite of their scanty foliage. It is to be observed that you must go a great distance from El Obeyad before a young Baobab is met with, all those which are found within 100 miles of this town are very old.

The town of El Obeyad is situated in the middle of a vast plain, very flat and smooth. At a distance, it seems to hide itself almost entirely in groves of Heglik (*Balanites egyptiaca*). It covers a large space of ground, and is said to contain from 20,000 to 30,000 souls. The buildings of the Mudirieh are of rectangular form, with an inner court. The façade is nearly 300 feet in length, and in the middle rises a square of burnt brick. The houses of El Obeyad, even the best, are very inferior to those of Khartoum and Berber, the most of them are tokles with circular walls of rough brick, which they build thus: they knead and form the mud into balls, which are transported to the wall in course of construction, and made into big bricks on the spot, which they immediately place, and which adhere without any mortar, after the wall is finished, they plaster it outside and in with pretty liquid mud. Thereupon, they place a conical roof, supported by wooden posts, at the extreme point is placed a cylindrical sheaf, from 3 to 4 feet high, well bound, from the centre of which rises a stick, rarely either straight or even. If the proprietor can fix on this stick a common bottle between two ostrich eggs, this architectural luxury becomes the admiration, and probably excites the envy, of all his neighbours. These stubble roofs are impenetrable by rain. The largest tokles are 20 feet in diameter, and have no opening but the door, which is shut by a mat or a hurdle.

The merchants and well-to-do people also build square houses of one story, called duldur, which they cover with the same kind of roof, but the houses of most pretension in El Obeyad are rectangular. The inner walls, of 15 feet high, are plastered with very fine clay, which sparkles with mica, and which gives a polished surface. As there is no lime here, the colour of these walls is coffee and milk, the ceiling is made like the walls. The roof of these houses is almost flat, and formed of beams, on which they place a network of cord, then straw matting; they cover these mats with a bed of earth, mixed with cow-dung dried by the sun. But these roofs are not proof against the rain, as are those of stubble, and require frequent repairing during the rainy season The rooms which they build are lofty, furnished with doors and windows coarsely made, but tolerably good, they are fresh and well ventilated. In the one which I occupied during the six months, the thermometer seldom rose to 90° Fahr, 32° 2 Cent., and I suffered less from heat than at Cairo

The reports of Commandant Prout and Dr. Pfund give every necessary detail concerning those parts of Kordofan and El Obeyad which they visited On my arrival in that town I was lodged in a good house, the paralysis made rapid progress, and it became impossible for me to change my position in bed without the aid of one or two men, but I was at least relieved of the responsibility of the command The duties which I undertook on leaving the Nile, when I was already so seriously ill, viz, to retain the command of the Expedition which had been entrusted to me until I could transfer it into capable hands, had been fulfilled even to the very last moment My legs and feet began to swell, and I thought, as did all those about me, that this was a certain sign that I had not more than a few days to live, my sufferings were so frightful at this period, that a speedy death to terminate them was my sole desire But, thanks to God, after some days they began to lessen. During the six months that I was confined here with this illness, I recovered a little strength, but the paralysis of my legs still prevented me walking or even mounting any riding animal, but my most bitter regret was to abandon an Expedition to which I had attached so much hope, and to see my companions continue it without me

However, I dare hope that my efforts thus far have not been fruitless in the service of our illustrious sovereign, his Highness the Khedive

I cannot finish this report without expressing my sincere gratitude for the affectionate care which was lavished on me by all those about me But for the skill and indefatigable attention of Dr Pfund, the malady, aggravated by the want of medicine applicable to the case, by the most unfavourable diet, by the heat and fatigue of the journey, would certainly have carried me off. Commandant Prout contributed in every possible way to alleviate my sufferings, and to enliven the dull hours of a long and painful convalescence

I think that even in an official report it may be permitted me to mention the meritorious conduct of those in a more humble position The attentions of my faithful servant, Thomas Ferranti, were marked with an affection and unselfishness which one could only have expected from a devoted parent, and which helped much to save my life He was well seconded by my ordinary corporal, Abou Zeid, and the soldiers, Marzouk and Mousa Their zealous help during whole weeks, during which their sleep was interrupted eight or ten times every night, deserves the most honourable mention

In short, I shall always remember with affection the good will with which all the soldiers of the escort carried me on their shoulders 160 miles, under a burning sun, and when the sand burned their feet, without even a murmur of impatience So laborious and so well accomplished a service is a proof of the existence of most excellent qualities in the Egyptian soldier

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2. *On the Correction of an Error in Mr. Hind's Map of the Elbow of the South Branch of the Saskatchewan* By the Right Hon. the Earl of SOUTHESK.

Rochampton House,
March 9, 1876.

SIR,

Some two months ago I received a communication from Mr Henry Y. Hind (formerly in charge of the 'Assiniboine and Saskatchewan Exploring Expedition,' organised by the Canadian Government in 1858) which circumstances have hitherto prevented me from bringing before the Royal

Geographical Society, as very specially requested by the gentleman referred to The letter being somewhat long, it seems best to offer it in abstract, retaining only the more important passages, and in this abridged form I hope that the Society may see fit to enter it (or the corrections it indicates) in their 'Proceedings' or other records It should be noted at the outset that Mr Hind published (in 1858) two volumes, detailing the work and progress of the Expedition under his charge—a book to the accuracy and general merit of which I desire to bear testimony, having travelled in the following years (1859-60) through a considerable part of the country surveyed and described

Mr Hind begins his letter by stating that he has read my recently-published volume ('Saskatchewan and the Rocky Mountains,' a copy of which I had the honour to place in the Society's Library), and has been "much interested in my remarks on the Elbow of the south branch of the Saskatchewan" "I was, however," he continues, "at a loss to understand how so great a difference could have arisen between our estimates of the value of the Angle in the course of the river at the Elbow, for, on measuring the sketches you give (see p 77, 'Saskatchewan,' &c), I found the difference about 40° To satisfy myself, I referred to the Field-books of my Expedition Much to my surprise, I have found a memorandum of 'Error in the Bearings' for the evening of July 30th and the whole of July 31st, 1858, in Mr John Fleming's (attached to Expedition) Field-book I have transcribed a facsimile of the two sheets in which the errors are noted,* and find them to be nearly uniformly 40°" Mr Hind then proceeds to state that on that occasion Mr Fleming had taken the bearings hurriedly, in a canoe—having been forced to embark in order to avoid a Blackfoot war-party—and on comparing compasses next evening, it was discovered that Mr Fleming's compass-card had shifted about 40° "The question which at once arose was, *When did the error begin?* The men refused to go back, for fear of the Blackfeet We then and there decided that in all probability the error began when we started from the Elbow the evening previous, and when Mr F first used his small pocket-compass" On that supposition the courses were accordingly "corrected" "But," writes Mr Hind, "it now occurs to me, after reading your lordship's very careful description, that we must have been wrong in supposing that Mr Fleming's observations were in error *from the time* we started from the Elbow And if so, . the original column is partly right, to some point lower down the river Hence, the bend at the Elbow, instead of being as Mr F plotted it, about 110°, *is really about* 70 *degrees*, and this is the exact angle given in your sketch"

It consequently appears that the map of the Elbow in Mr Hind's book (hitherto, doubtless, received as authoritative) stands, almost certainly, in need of large correction This river-angle, often termed the 'Indian Elbow,' is of some importance, for it is the point whence a junction might be made between the courses of the South Saskatchewan and those of the Assiniboine and Red River, thus establishing a water-way through the vast territories lying between Assiniboia and the Rocky Mountains †

I am, Sir, your obedient servant,
SOUTHESK

To the Secretary,
Royal Geographical Society

See following pages.

† See Hind, 'Ex. Exped', vol i 426-430.

TRACK SURVEY of the SASKATCHEWAN, commencing at MOUTH CREEK—supposed to be "HEART RIVER," shown on THOMPSON'S MAP—flowing from QUAPELLE VALLEY.

Friday, July 30, 1858

Departure	Arrival.	Difference	Rate.	Length in Chains.	Course	Corrected Course †	Left Offsets	Right Offsets.	REMARKS
VII 00	VII 7	7	3 = 3	28	N 55 W	N 15 W	50	2	To shore on R and L
8		6	5 = 5	40	N 85 W	N 45 W	40	3	
14		8	4½ = 4½ Current	48	S 80 W	N 60 W	30	4	
22		2	2½ + 3 = 5½	15	S 70 W	N 70 W			Rate of canoe through water, 2½ miles per hr + current 3 miles per hr = 5½ total rate
24		2	,,	15	S 80 W	N 60 W	12	5	To end of island on L *
26	..	5½	,,	41	,,	,,	8	4	L to island + River shallow here Rock expos on R (landed exp^{dn}), camped on R
				216 = m ch 2 56					
Saturday, July 31, 1858									
VI. 25		3	,,	22	S 70 W	N 70 W			
28		6	,,	44	S 45 W	S 85 W	8	12	To I on L
34		7	,,	51	S 75 W	N 65 W	4	10	„ to island on R, 20 c long
41	..	6	,,	44	,,	,,	15	15	River shallow here to I on L Bank of river on R
47	..	5	,,	37	,,	,,		9	Sand-bars and shoals here
52		7	,,	51	,,	,,	35	10	End of Long Island to end 15 *
59		18	,,	132	,,	,,	40	4	Scattered patches and clumps of scrub pop on banks
VII 17	.	5	,,	37	S 80 W	N 60 W	20	5	To low sand island on L, 15 c long
22		9	,,		,,	,,	20 + 20	5	End of island on L
31	.	3	,,	22	,,	,,	25 + 30	8	
	34			.			10	.	To sand bar on L
				506					

† Needle 40° too far E (− 40) − 36 (error in N)

TRACK SURVEY of the SASKATCHEWAN—*continued*

Saturday, July 31, 1858

Departure	Arrival	Difference	Rate	Length in Chains	Course	Corrected Course †	Left Offsets	Right Offsets	REMARKS
V 18		7	2½ + 3 = 5½	51	S 60 W	N 80 W	30	12	Shoal Banks of river appear lower
25		4	,,	29	S 70 W	N 70 W	35	4	Creek in broad valley comes in on L
29		9	,,	66	W	N 50 W		5	Very little timber on banks—a few scattered clumps of scrub poplar
38		3	,,	22	S 80 W	N 60 W			
41		3	,,	22	N 80 W	N 40 W			Creek comes in on L (Indians camped on L)
	V 44		,,				25	12	Shoal here (stuck on sand-bar)
46		6	,,	44	N 65 W	N 25 W			
	52		,,						
54		14	0 + 3 = 3	56					Drifting with current, 3 miles.
VI 8		4	2½ + 3 = 5½	29	N 30 W				
12		13	,,	95	N 15 W		20	15	Sand-banks on R
25		12	,,	88	,,		8	25	Indian encampment on both sides here (crossing place)
	VI 37		,,		,,				
50		12	2½ + 3 = 5½	88	,,				Start sailing
	VII. 2		,,		,,				
VII 3		11	1½ + 3 = 4½	66	,,				
14		8	2½ + 3 = 5½	59	,,		4	30	
22		31	,,	228	,,		8	25	Sand dunes on R
	53				,,				Went ashore on R and camped, July 31, 1858
				943					

† Needle 40° too far E (– 40) – 39 (error in N).

Note by H Y Hind—I omit from this copy the observations from VII hours 31 minutes to V hours 18 minutes, the corrections for the needle continuing throughout the day

Note by Lord Southesk—The above is an extract, by Mr Hind, from Mr Fleming's Field-book Mr Hind's letter to me (see my extracts from it) points out that those *supposed* corrections were erroneous, the compass not having gone wrong till afterwards No error really existed, thus the so-called "Corrected Course" is incorrect to the extent of the correction made

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Published August 23rd, 1876.]

SESSION 1875–6.

Thirteenth Meeting, 12th June, 1876.

Sir RUTHERFORD ALCOCK, K.C.B., President, in the Chair.

Presentations.—*Capt. J. P. Cheyne*, R.N.; *Capt. Carl Alexandersen.*

Elections.—*Major-Gen. Saunders Abbott*; *Capt. W. A. F. Blakeney*; *G. P. Boyer, Esq.*; *David Brandon, Esq.*; *Walter George Bridal, Esq.*; *Henry Dent Gardner, Esq.*; *Francis Henry Hill Guillemard, Esq.*, B.A.; *Walter Oswald Hirst, Esq.*; *Clement St. George Littledale, Esq.*; *Benjamin John Malden, Esq.*; *Lieut.-Col. William E. Warrand*, R.E.; *Thomas White, Esq.*

Donations to Library, May 8 to June 12, 1876.—Orographical sketch of Minusinsk and Krasnoyarsk, 1873, and of Eastern Siberia, 1875, in Russian, by P. Kropotkin (*Author*). Catalogus codicum latinorum Bibliothecæ regiæ Monacensis, ii., pt. 2, 1876 (*The Royal Library, Munich*). Cruise of the *Pandora*, from the private journal of Capt. Allen Young, 1876 (*Author, per Messrs. Clowes*). Giles's Explorations, South Australia, 1875 (*Hon. Thomas Elder, Adelaide, per A. v. Treuer, Esq.; also from H.M. Sec. of State for Colonies*). Statistical Register of Victoria, 1874, concluding parts; Reports of Mining Surveyors and Registrars, 31st Dec., 1875; Statistics of Friendly Societies, 1874, and Supplementary Tables to Australian Statistics, 1874 (*The S. Australian Government*). Geological Survey of Victoria; Prodromus of Palæontology, Decade iii., by F. McCoy, 1876 (*The Survey*). U. S. Hydrographic Office publication, No. 60, Coasts of Biscay, 1876 (*The Office*). South Australia, edited by W. Harcus, 1876 (*F. S. Dutton, Esq.*). The Geographical distribution of Animals, by A. R. Wallace, 2 vols., 1876 (*Author*). Zeitschrift fur allgemeine Erdkunde, n f, Nos 114, 125, and 126, and Zeitschrift der Gesellschaft fur Erdkunde zu Berlin, Nos 23, 35, 41, and 51 (*Dr Koner, in completion of series*) 'L'Explorateur,' vols i and ii, 1875 (*Editors*) Transactions of the Royal Historical Society, vols i–iv, 1869—1876 (*The Council of the Society, per Rev C Rogers*) Diocesan Registers of Glasgow, vols i. and ii, 1875, Monuments in Scotland, by C Rogers, vol i, 1871, The Scottish house of Edgar, 1873, Boswelliana, 1874, and Estimate of the Scottish Nobility during the minority of James VI, by C Rogers, 1873 (*Grampian Club publications, from the Council of the Club, per Rev C Rogers*) Scots' Staggering State, 1872, The Poetical Remains of James I, 1873, and The Scottish house of Roger, 1875, by the Rev C Rogers (*Author*) Beskrivelse af Tromso Amt, Kristiania, 1874 (*The Norwegian Geographical Institute*) Selections from Records of the Madras Government, No xlix. (*H M Sec of State for India*) L'Afrique centrale d'après Cameron, par G Renaud, 1876 (*Author*) Amphiorama, par F W C Trafford, 1875 (*Author*) Commentatio de geographia Africæ Edrisiana, auctore J M Hartmann, Gottingæ, 1691, Histoire de Loango, Kakongo, et autres royaumes d'Afrique, Paris, 1776, and Descripçaõ do estado, &c, da Capitania de Mossambique, por J J Nogueira de Andrade, 1790, MSS (*W D Cooley, Esq*) Tenth Annual Report on Colonial Museum and Laboratory, New Zealand, 1875, by J Hector (*Author*). The True Travels, &c, of Captaine John Smith, 1630 (*W Chandless, Esq*) The Roof of the World, by Col. T E Gordon, 1876 (*Author*) Anuario hidrografico de la Marina de Chile, Año ii, 1876 (*Captain F Vidal Gormaz*) General Report on the operations of the Great Trigonometrical Survey of India during 1874–75, by Col J T Walker, 1876 (*The Survey*). The Colonising Association, New Guinea, Rules, &c, 1876 (*The Association*). The History of New Guinea, by R H Armit, 1876 (*Author*). Annual Report, for 1874, of U S Geological and Geographical Survey of the Territories, by Dr F V Hayden, 1876 (*Author*) Die Triangulation von Java, Erste Abtheilung, von J A C Oudemans, 1875 (*Author*) Monatsbericht der k preussischen Akademie der Wissenschaften, Juni, 1872 (*The Academy, in completion of series*) The Ice Age in Britain, by Ralph Richardson, 1876 (*Author*). The evidence of glacial action in the Nágá Hills, Assam, by H. H Godwin-Austen, 1875 (*Author*), and the current issue of publications of corresponding Societies, periodicals, &c

DONATIONS TO THE MAP-ROOM FROM 8TH MAY TO 12TH JUNE, 1876.—Map of the China Tea Districts, 2 copies (*Reginald Hanson, Esq*).

Seven sheets of the Topographical Survey of Sweden, $\frac{1}{100000}$ (*Col. V. von Vegesack, Director*). Eight sheets of the Topographical Survey of Norway, $\frac{1}{100000}$, with Title-sheet and Index-map. Sheet IV. General Map of Southern Norway, $\frac{1}{400000}$; N. sheet of South Bergenhuus Amt, $\frac{1}{200000}$; S.E. sheet of North Bergenhuus Amt, $\frac{1}{200000}$; S.E. and S.W. sheets of Tromso Amt, $\frac{1}{200000}$. Eighteen sheets of Norwegian Admiralty Charts (*Geographical Institute of Norway, through Lieut.-Col. Broch*). Map of Province of Kordofan (*General Stone, Chief Staff, Egyptian Army*). Eleven sheets of Admiralty Charts (*Hydrographic Office*). Boat Survey of Lake Nyassa, 1876, MS. (*Mr. E. D. Young*, R.N.). Map of part of the Malay Peninsula, 1876 (*Quartermaster-General's Department, Horse Guards*). Map of Japan, showing distribution of Minerals (*Lord Arthur Russell*, M.P.). Map of Nova Zemlia, and North coast of Russia, 1875 (*Prof. Nordenskiold*).

The PRESIDENT in introducing the subjects of the evening, stated that the first paper was a letter which the Society had received from Mr. E. D. Young, who was originally engaged with Dr. Livingstone in the Zambesi Expedition, and who was afterwards in 1867 selected to inquire into the truth of the rumour of Dr. Livingstone's death. He performed that mission with great zeal, intelligence, and success, and he was subsequently chosen by the United Scotch Missions Committee to lead their missionary party last year to Lake Nyassa. His geographical zeal overlaid even his missionary work, and he could not, after establishing the Mission Station, resist the temptation of seeing whether Dr. Livingstone had really got to the northern end of the Lake. To his great delight he found that it extended full 100 miles further than Dr. Livingstone imagined.

The following Letter was then read by Mr. R. H. Major, Secretary:—

MY DEAR SIR, Lake Nyassa, 19th February, 1876.

I HAVE very great pleasure in informing you that our Mission here has hitherto been quite successful, and that everything is going on satisfactorily; the whole of the party is in perfect health. We have a very good station with plenty of provisions, and I have reason to know that our presence here has been the means of doing much good amongst the poor down-trodden people.

After I had seen everything straight at the Mission Station, houses built, &c., I took four of our party and some negroes, and departed for a cruise round the Lake. The journey occupied us a month. It is a much larger sea than Dr. Livingstone thought; the north end extends to 9° 20′ S. lat. In most parts it is very deep; no bottom could be found with 100 fathoms of line within the same distance from the shore in several places at the north-east, and there is a range of mountains extending nearly 100 miles, ranging from 10,000 to 12,000 feet above the Lake There are also a great number of rivers running into the Lake, but none navigable for any distance at the north end there is one running out of the Lake, which the natives call the Rovoma While looking for the mouth of it, bordering on a marsh, we were caught in a tremendous gale of wind, we were compelled to lie-to all night, with both anchors down, and steaming ahead at the same time, and being on a lee-shore, short of fuel and provisions, were compelled to get out to sea the first opportunity, in fact, I expected every minute to see her dashed ashore, where we should have been in the hands of the murdering Mizitu tribe, it is true it was the worst time of year for such a voyage I send a rough sketch-map of the Lake, which will give you some idea of its extent I propose returning home in a few months, when I will give you full particulars

The shores of the Lake are not so thickly populated as formerly, the greater number of the inhabitants having been carried off as slaves I visited all the Arab slaving stations, and the very sight of the steamer has struck terror into them, there are five dhows which convey slaves across, and I should think, from all I can gather, not less than 20,000 a year are thus carried off The population on the south and west is centred round the chiefs, who are employed by the Arabs to make war with the tribes inland to the west, and those that are captured are taken as slaves I firmly believe that a dozen resolute Englishmen, with a vessel similar to this, and some few bales of calico, would put a stop to the whole traffic I should be delighted to take the dhows at once, but my hands are tied at present

The scenery in most parts is grand in the extreme

The Arabs were so much astonished and frightened when they heard that the English had come with a steamer, that no slaves were conveyed across for a whole month—a clear proof that they are aware that we can command the Lake O how I long to have a turn at them, and to clear the blood thirsty wretches out of this lovely country! The common people are rejoiced at our presence, and for many miles around us slavery has ceased, as there are no Arabs brave enough to come near us

There was little rain, and there was no rise on the Lake till the middle of January, excepting at the north end, where it rained and blew tremendously

At some parts of the Lake there are numbers of villages built on piles in the Lake, many people in other parts are living on barren rocks They are the few who have escaped in canoes from the slavers. Poor wretches! They are lingering out a miserable existence

Should I remain here long enough I will make a more complete survey of the Lake in the season when the weather is more favourable; as it was, we had to lie-to for days and nights riding out storms. The steamer is a splendid sea-boat, steams well and sails fairly, and nothing smaller would be fit to navigate the Lake.

We visited some lovely spots, and the sites of many villages where the ground was strewn with thousands of skeletons, the remains of poor creatures who were killed in attempting to get away from the slaving wretches.

E. D. YOUNG.

To the Secretary of the Royal Geographical Society.

The Rev. HORACE WALLER said the service which Mr. Young had undertaken had for its motive power philanthropy in its purest sense. Mr. Young was formerly gunner in her Majesty's Navy on board the cruiser *Gorgon* on the East Coast of Africa. There he first began to see what the slave-trade was, and he was noted for his activity and zeal in carrying out his duties. He was afterwards selected by his commanding officer as a man likely to be useful in Livingstone's Expedition to the Zambesi, and in that capacity he gained the esteem of all the other members of the Expedition. Last year Mr. Young heard that many gentlemen in Scotland wished to do something for the memory of Livingstone, which would be more enduring than a mere monument in Glasgow or Edinburgh, and he was invited as a thoroughly competent man to give them the benefit of his opinion. He spoke at their meetings with a clear knowledge of Livingstone's wishes and thoughts, and told them that if they could only establish a Mission Station, and launch a steamer on Lake Nyassa, they would be doing a great good to Africa, and carrying out Livingstone's most cherished desires. Everything went on favourably: men rallied round him who were able to provide the necessary funds, and Mr. Young was the right man to accomplish their object. From what he (Mr. Waller) had seen of Expeditions, he had no hesitation in saying, that if this Nyassa Mission had been led by a man less experienced and less beloved by the natives, in all probability it would have added one more to the list of failures. The funds having been raised, the Scotch Committee applied to Mr. Yarrow, the shipbuilder in the Isle of Dogs, and had a steamer constructed of steel plates, in such form that each section would be a load for a man in carrying the vessel by land past the cataracts of the Shire, and owing to this arrangement, the difficulties in the way of reaching Lake Nyassa from the sea by river had been overcome. In October last the steamer was successfully put together above the obstructions, and Mr. Young had the satisfaction of launching the first steamer on an African Lake. All who were acquainted with Africa, and had its future welfare at heart, must feel what an important event this was. If the slave-trade was to be confined within bounds, it must be by the navigation of these great inland seas. Mr. Young had proved that on the higher level on which the lakes were situated it was perfectly possible for Englishmen to live in health and strength. There were two ways of living in Africa. A person might settle down on the coast and live, but it would be mere existence, and he would hate himself for the langour and laziness he felt day by day, and would soon become useless to himself and everybody about him. If, however, he wished to do any good to the Africans he must get up to the high lands as soon as possible. To live on the low lands was death or inaction, but to get on the plateau was life and usefulness It was a most significant fact that there had not been a grumble or a quarrel amongst Mr Young's party, for it was the evil nature of fever poison to show itself first of all in grumbling on the part of those who otherwise would be the best of friends Lake Nyassa was discovered by Dr Livingstone and his companions, Charles Livingstone, Dr Kirk, and Mr Rae, in 1859 it was subsequently visited by Livingstone, his brother, and Dr Kirk in 1861, and again by Livingstone in 1863 and 1866, but on no occasion was Livingstone able to get near the north end of it He said that there were high mountains to be seen from the west coast, apparently shutting it in Mr Young, however, had gone to the point where Livingstone turned back, and found that the Lake extended far beyond it to the latitude of 9° 20′ S At first sight it might appear that adding an extra hundred miles to the Lake was only interesting from a geographical point of view, but many people now indulged the hope that the effect would be that more steamers would quickly be placed on the African lakes The southern end of Tanganyika was now shown to approach pretty closely to the northern end of Nyassa, from which there was a clear water-way to the Indian Ocean, with natives willing to help the English in every way, as they had proved by carrying the sections of Mr Young's steamer past the obstructions Eight hundred of them were engaged in that work, and not the value of sixpence was lost by robbery or destruction Lake Nyassa was at present a no-man's lake, belonging neither to the Portuguese nor the Arabs It was the centre plague-spot of the slave-trade, for in spite of all the treaties that had been made on the coast, and in spite of the proclamation made the other day by Dr Kirk, unless somebody in the interior worked in accord with Dr Kirk at Zanzibar, the treaties were only so much waste paper The slave-traders were at present doing just as they did ten or twelve years ago, sending 20,000 slaves annually across the Lake

One suggestion he had to make was that if the Government would supply Mr Young with a boat's crew of man-of-war's men he would strike terror into the Arabs on both sides of the Lake, and do more to stop the slave-trade than all the cruisers on the coast

The PRESIDENT said he regarded the launching of Mr Young's steamer on Lake Nyassa as the beginning of a long series of triumphs for civilization over barbarism and all the evils that attend the slave-trade Mr Waller's suggestion would, he was sure, not fall dead There was no reason why there should not be two or three steamers on each of the four great African lakes, and if that were accomplished and centres of civilizing tendency established on the high lands, the conquest of Africa in the spirit of Christian zeal and civilization would not only be begun, but half over He might inform the Meeting that the King of the Belgians was most anxious to take a leading part in uniting the different Governments and Geographical Societies in an international Congress, the object of which was to be to consider how the African interior might be thoroughly explored and the country taken possession of, not for territorial aggrandisement, but in order to open up those great water-ways to the commerce of the world He had no doubt that, before many months were passed, great progress would be made in that direction, and he was quite sure the necessary funds and assistance would be given when asked for. He had ventured to say this to the King of the Belgians, and felt that he had not promised too much for his countrymen, or for the Geographers of this Society

The following Paper was then read —

The Valley of the Tibagy, Brazil. By THOMAS P. BIGG-WITHER, ASSOC. INST. C.E.

[ABRIDGMENT.]

IN the year 1871 a concession had been granted by the Brazilian Government to the Baron (now Viscount) Mauá and others, for the survey of a line of railway and steam-ferry communication between Curitiba, the capital of the province of the Paraná, and the town of Miranda, situated near the western boundary of Brazil, in the province of Matto Grosso.

The route, as laid down in the concession, was to pass through Colonia Thereza, and down the Ivahy Valley, to the Paraná, and thence up the valleys of the Ivinheima and Brilliante, and across the dividing ridge into the valleys of the Nioac and Mondego, upon which latter river, a tributary of the Paraguay, Miranda is situated.

This survey was commenced in the month of August in the following year, and the author was engaged, in conjunction with three other engineers and a staff of Indian and Brazilian workmen, in exploring that section of the Ivahy Valley which lies between Colonia Thereza and the Corredeira de Ferro, or "Iron Rapid."

The country between these two points was found to be generally broken and mountainous, and covered by dense tropical and semi-tropical forests, uninhabited, except by tribes of wild Indians, the most formidable of whom, namely the "Coroados," were chiefly collected in the district lying between the Salto das Bananeiras and the "Iron Rapid." It was the presence of these Indians on the line of the exploration, and their avowed hostility to the objects of the expedition, that threatened to impede, if not entirely to prevent, the completion of the survey. The men of the staff being mostly Brazilians, were imbued with a strong traditional dread of even the name of "Bugré," or "Wild Indian." Consequently on the sudden appearance in the camp, a year and a half after the commencement of the survey, of a number of wild Coroados, a panic seized them, and the endeavours of the engineers were fruitless to stop it. So far did it go that, in the dead of night, it was discovered that a conspiracy was in progress for deserting the engineers in mass, and this was only stopped by threats of extreme measures.

With such men it was useless to attempt continuing the exploration, and it was accordingly found necessary to abandon it for the time, and retire up the river.

Now, on referring to the Diagram it will be seen that there is another obvious route by way of the Tibagy Valley, by which the high prairie-land district of the province might be connected by a road and water communication with the Paraná River, and, moreover, this alternative, on the face of it, appears to possess at least equal, if not superior, facilities to those afforded by the original Ivahy route. The most difficult portion of the latter for the construction of a railway, namely, the lofty intervening range of hills, which forms the watershed between the two valleys, would be altogether avoided; and if it could be ascertained that the passage cut by the Tibagy through the Apucarana range was something more than a mere deep gorge or cañon, and was wide enough to allow of a road being constructed between the river and the mountains without the necessity of making a second Mont Cenis tunnel the advantages of this route would become still more obvious.

It should be mentioned here that the Paranapanema, from the mouth of the Tibagy down to the Paraná, can be rendered navigable for steamers of light draught at a comparatively small cost there being but two or three slight obstructions which would have to be overcome.

It was decided, then, that a preliminary exploration of this new route should be undertaken, while at the same time another attempt was being made to complete the original Ivahy survey. As to the result of this latter attempt, it may be stated that it ultimately proved entirely successful. Under the able conduct of Mr. Faber, who was assisted by a large staff of thoroughly experienced engineers, the whole remaining survey of this section was completed in the face of more than ordinary difficulties by the end of the year 1874. At the time now referred to, however, such happy result was of more than doubtful probability.

In the month of May, 1874, the exploration of the Tibagy Valley was commenced by the author, the little village of Conchas, situated on the banks of the river, at an elevation of about 2400 feet above the level, being taken as the starting point.

One of the principal objects of this exploration was the obtaining of a sufficiently accurate plan and section of the course of the river itself, in order to form a backbone, as it were, to all other observations.

To accomplish this satisfactorily, it was necessary to navigate the river for its entire length, as although in its upper course down to some little distance below the town of Tibagy the country on either bank is "campo," or open prairie, yet, on account of the many affluent streams and rivulets which, as in all mountainous countries, cut up the banks of the river at intervals of every few hundred yards or less, locomotion by land would probably prove to be not only the more tedious, but also the more difficult, means of progression of the two

From the Freguezia das Conchas down to where the Rio Pitangui enters (a distance of about 34 miles), the river pursues an even winding course, with no appreciable variations either in depth or width of channel The declivity of its bed is here also very slight, and, with the exception of one small cascade caused by an eruption of "trap" rock, it has no obstructions whatever, and is navigable throughout, even in the dryest seasons of the year, for boats or canoes drawing up to 1½ foot of water

The geological formation of both sides of the valley is sandstone overlying granite, which latter occasionally crops out on to the surface on the surrounding prairie

The land is not generally fertile, except at some distance from the river on the south-west slope of the valley, where beds of clay and gravel predominate, and forest commences

In marked contrast, however, to this upper portion of the river and valley is the general character of the section below, namely, that lying between the river Pitangui and the town of Tibagy, a distance by water of about 30 miles

Hitherto the river has been winding peacefully along through an elevated and comparatively level plateau, it has now, however, approached the verge of this plateau, and the big retrograde bend which it here makes seems to show that an obstacle has at last been encountered which cannot readily be passed Eventually, however, an outlet is found, and leaving the level plateau of this upper region, the river now enters upon a wild course of headlong, impetuous destruction, tearing its way down a succession of long inclined planes, till it reaches, after falling 600 feet in the short distance of 30 miles, the town of Tibagy. Here, once more, it appears for the time at least to have found its proper level, and subsides for a brief space into its former calm and even flow

The journey over this latter portion of the river was exciting in the extreme—the roar of the waters, the shouting of the men, as rapid after rapid was shot in quick succession, in conjunction with the general wildness of the surrounding scenery, combined to produce an impression upon the mind impossible to describe Nor was the descent accomplished altogether with impunity Of the two canoes forming the meagre locomotive outfit of the party, *one* had been, on first entering the rapids, unladen and employed as a pilot for the other and bigger canoe This canoe by some unlucky chance allowed herself to be drawn unawares into the midst of one of the most dangerous of the rapids, which might almost be called a cataract, and, being old and rotten, was soon smashed to pieces amongst the rocks Of the two men in her, both were seriously bruised and knocked about, and one was with some difficulty saved by his companion from drowning. With this unfortunate exception, the journey so far was successfully accomplished, and the objects for which it was undertaken duly attained

It was observed on this descent that all the chief waterfalls and cataracts were caused by "trap" rock eruptions, the normal sandstone formation not appearing to possess the requisite hardness and strength to enable it to resist the constant wear and tear of the water, and the occasional enormous strains which are put upon all such obstructions in time of floods The exceptions to this general rule, which was observed to hold good throughout the whole course of this river, were in those cases in which the "trap" had vitrified and hardened the stratum through which it had forced itself

A noteworthy example of this was seen in the case of the Salto da Conceição, where a triple wall of vitrified schist, basalt, and vitrified sandstone rears itself up vertically from the bed of the river, and traverses it in a straight line across, and, by thus damming up the water above, forms a beautiful waterfall of 35 feet vertical drop

It was also remarked that for some distance above the bigger waterfalls—a distance varying with the height of the fall—the river was free from obstructions Thus, in the case of the "Salto Grande," or "Big Fall," where the river drops 114 feet in only 800 yards, there occurs immediately above it a stretch, 9 miles long of perfectly smooth, deep water This is the longest reach by far of unbroken water that exists in this river, from where it first leaves the level plateau above, down to the point of its own junction with the Paranapanéma, a distance of about 270 miles

A remarkable difference was also noticed in the relative fertilities of the two parts of the valley, above and below the Pitangui River On the upper plateau, as before stated, the soil was not very fertile, and cattle were never found to fatten well upon its pasture In the lower portion, on the contrary, cattle thrive luxuriantly, and many kinds of richer grass, which are not found on the plateau above, here grow in abundance It seems as though there existed some mysterious connection between the character of the river and the fertility of the corresponding sections of the valley—as in both the change is sudden and simultaneous, and the boundary-line sharp and well defined—though to all appearance the geological character of the country remains unaltered.

This is, however, no doubt due simply to the vastly greater number of trap rock eruptions, which begin to occur immediately after leaving the plateau These eruptions no doubt extend to the valley on either side of the river, and by exposure to atmospheric influences, the "trap" is continually decomposing and fertilising with its products the otherwise poor and sandy soil.

This prairie-land attains to its greatest richness in the neighbourhood of the town of Tibagy, immediately before it merges into the still richer forest-land beyond

In spite of the want of good roads and the consequent difficulties of transport, cattle as well as considerable quantities of vegetable products, such as beans and farinha, find their way from this part to the markets of Castro, Ponto Grosso, Curitiba, and Antonina, as well as into the chief towns of the adjoining province of São Paulo

The climate of the whole of this upper part of the valley is temperate In the months of May and June the nights are generally frosty, but the days are bright and warm The extreme ranges of temperature throughout the year may be taken as from 28° to 100° Fahr, the lowest being in June, and the highest in January

The air is most invigorating, and, contrary to the usually received opinion, that the nearer the equator the greater becomes the requirement for stimulants, on these prairie regions the human constitution feels a less craving for stimulating drinks than it does in higher latitudes

The rainy season is not well defined, but generally the months of December, January, and February are the wettest in the year—though heavy rains occasionally fall in the month of July

Statistics of the annual rainfall in these parts are altogether wanting, but it is certainly very much less than that on the sea coast, along the line of the Serra Geral Probably it might amount to from 40 to 50 inches, as an extreme calculation

The unanimous testimony of Europeans who have lived or travelled in the prairies of this province is, that the climate ranks second to none in the world in point of salubrity And certainly the valley of the Tibagy is no exception to this universal rule In fact, no disease now exists amongst the inhabitants * There is, however, an island in the river at some distance below the town, called Mump's Island, and a tradition exists of that disease having once appeared, many years before, amongst some diamond washers who were there working Fever of any kind is altogether unknown

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* Syphilis alone should be excepted, but even this dire disease is much less virulent here than it is in Europe, though the taint is very widely spread amongst the people

The population of the town of Tibagy, including the district for a radius of 10 miles round, is about 3000. The people, who have the blood of three distinct races in their veins, namely, Indian, Negro, and Portuguese, are agricultural in their pursuits, and, if neither hardworking nor enterprising, are certainly a frugal and contented race Their triple nature exhibits an odd mixture of good and bad qualities, and is only to be understood by long and intimate acquaintance with them Hospitality to all comers is their great creed, and one which the traveller most appreciates General laziness, both of mind and body, is the characteristic of all but the richer class of the people This bad quality certainly cannot be produced by the climate, but is, more probably, inherent in their nature itself, and is, no doubt, fostered by the extreme ease with which their livelihood can be always obtained The result is that, with the wealth of a kingdom around them, they are content to pass their lives in a state but little less brutal than that of the wild Indian himself

This picture is only a reproduction of what may be seen in so many other of the outlying settlements of the interior of Brazil, and the thought cannot help forcing itself upon the mind of the traveller who sees all this, that the people are not worthy of the country

On the 5th of June the journey was resumed by land from Tibagy as it was thought wiser to explore the river upwards from Jatahy, in order that the risk of disaster in navigating its many unknown rapids and cataracts, which were certain to be encountered, might be lessened as much as possible

The road, which is merely a mule track, runs along the north side of the valley at some distance from the river, as shown on the Diagram The slope on this side of the valley is very rapid, Fortaleza being 1200 and Monte Alegre 1400 feet above the level of the town of Tibagy On the opposite side of the valley the general summit of the watershed has the appearance of being still higher

On leaving the prairie and entering the forest the general altitude of the country apparently diminishes, but this is due merely to the nearer approach of the road to the river, and not to any sudden change in the configuration of the valley.

Pine-trees, most of them of enormous size, are here the characteristic growth of the forest, at all altitudes, that is above 1600 to 1700 feet above sea-level Below this line they suddenly and completely disappear, and their place is taken by other and more tropical types of vegetation. These pine-trees grow to a height of 130 and 140 feet, their trunks rising straight and branchless to within a few feet of their summits, where a multitude of long slender boughs start out horizontally from the trunk, and form an umbrella-like top of about 60 feet in diameter, which is the favourite resort, especially in the fruit season, of innumerable flocks of parrots, Brazilian jays, and monkeys.

At a short distance from the little settlement of Alambary the base of the Apucarana and Agudos range is reached, and, about half-way between Alambary and St. Jeronymo, the road crosses the ridge at an elevation of 3400 feet above sea-level, and shortly afterwards emerges out into an open patch of "prairie," or "campo," which (strangely enough at first sight) here rises up bare and bleak, out of the midst of the luxuriant surrounding forest. A similar patch, called the "Campo de Inhohô," appears a little nearer to the river.

These little bare patches or "campos" seem altogether out of harmony with the surroundings—not only in their comparative sterility, but also in the configuration of the ground. Whereas, in the forest-land surrounding them, it would be difficult to find a level spot of 5 square yards together, here you have many square miles of an almost perfect plain; and so flat is it, indeed, on these campos that a large proportion of their extent is permanently covered by swamps.

The following facts observed, appear to afford some key to their origin:—

The range of the Agudos and Apucarana is due to volcanic agency. Great masses of "trap," chiefly consisting of porphyries, have been upheaved and erupted through the overlying strata of sandstone and other formations, and have caused a vitrification of the latter at all the surfaces of contact. Subsequent to this eruptive upheaval (which must have acted with nearly equal force over large areas) denudation came into play, carving out the steep slopes and deep valleys and ravines over which the forest has now taken possession, and leaving exposed, in such places, to the disintegrating action of atmospheric influences the highly-fertilising volcanic rocks; but on the other hand, wherever the hardness of the stratum, aided by an absence of declivity, or "dip," in its bed, over any considerable area, resisted these forces of denudation, there level tracts have been left remaining, covered only by their hard protecting shell.

Now, as a matter of fact, these campos show (beneath a small depth of supersoil) a surface, more or less smooth, of hard vitrified sandstone; and in one or two cases where, near their boundaries, small streams have, in the course of ages, cut their way through this upper shell, it is seen that the igneous rock lies immediately beneath, as must necessarily be the case if the above explanation be correct The appearance of the tough prairie-grass in the place of the luxuriant forest is also a necessary consequence of this theory of their formation, and thus the whole phenomenon is explained without difficulty

These little campos, rising up in the midst of the forests, are of not uncommon occurrence, and generally, if not invariably, are found in close connection with volcanic ranges, where also sandstone is the overlying formation

Another example, as shown on the Diagram, occurs on the range of mountains which divides the waters of the Tibagy and Ivahy, which range is likewise of volcanic origin

These particular spots on the Agudos Range were discovered in the year 1845, by an American named Elliott, who was exploring the country on behalf of the Baron de Antonina He discovered them from the top of one of the peaks of the Apucarana, between 20 and 30 miles distant on the opposite side of the valley, and a few years later the present settlement of St Jeronymo was founded, and Mr Elliott himself, now old and broken down in health from his past hard life as an explorer, is spending his declining years on the very spot which he himself had discovered thirty years before

As regards the passage of the river through this range, from a point at the southern extremity of the Campo de Inhohô, at an elevation of 3300 feet, a very complete view of the whole of the south-west side of the Tibagy Valley is obtained This view extends from the range of the Pedra Branca above the town of Tibagy, down to and even beyond the valley of the Paranapanéma, and stretches away to the westward, where no hills intervene, as far as the eye can reach.

This vast tract of rich and fertile country, embracing an area of thousands of square miles, is covered still by virgin forest, and inhabited only by a few wandering tribes of wild Indians And thus it is likely to remain for generations to come, either until another Paraguayan war forces the Government to construct the long-meditated road down this valley, or until the country itself passes into the possession of a more enterprising people, neither of which events is perhaps likely to come to pass for many long years to come

From this station on the Campo de Inhohô the River Tibagy for several leagues of its course lies mapped out beneath The white lines and patches here and there discerned upon it mark the position of so many falls and cataracts, and the quickened imagination almost fancies that it hears the roar of the rapids rising up from the depth below. The distance is, however, too great

The evidence of the river once having filled a far greater breadth of valley than that which now suffices to contain its diminished volume is here very striking The long lines of equi-altitudinal hills, ranged like gigantic amphitheatres opposing each other on either side—the many-scarped slopes, all directed inwards and towards the centre line of the valley—these were striking features, and rendered the more noticeable from the fact that, from this elevated point of view, all minor configurations of the ground, which would otherwise have been apt to confuse the eye, had disappeared, or were visible but in their just relative proportions

Hence it was now quite evident that the pass cut by the river through the Apucarana Range was not a mere deep gorge or cañon, but, on the contrary, was a wide valley, offering no insuperable difficulties to the construction of a railway through it

On resuming the journey from St Jeronymo, and after having passed the little river of the same name, the general aspect of the valley once more changes The abrupt and mountainous region of the Agudos is left behind, or planed down into low, gently undulating hills, while, at the same time, the character of the vegetation becomes more completely tropical, and the last pine-tree disappears and gives place to the piroba, the garlic-tree, and the fig-tree, each of which rivals in its dimensions the monarch that it has displaced

We now come to the village of Jatahy, which is a military colony, containing about 450 inhabitants, and which, almost ever since its formation in 1852, has remained in the state of stagnation common to so many of the backwood settlements in this country

During the time of the Paraguayan war it was used by the Brazilian Government as a depôt for military stores, and rose to temporary activity in consequence Upon the conclusion of the war it relapsed again into its former state though buoyed up for the time by the hope that the Government having once proved the value of the station as a strategical point, would make some effort to open-up better communication with it from the eastward than the wretched mule-tract already existing These hopes have not, however, yet been fulfilled.

Like most of the smaller Brazilian rivers on the borders of the tropics, the Tibagy is subject to frequent and violent floods, occurring at irregular intervals

On account of one of these sudden and unexpected rises, the author was detained at Jatahy from the 2nd to the 25th of July.

After nine days of incessant rain, the river opposite the village, where it was about 200 yards broad, rose 33 feet, and the volume of water which it discharged increased from 8000 to 200,000 cubic yards per minute.

Immense trees, accompanied by an enormous amount of débris, swept down in endless succession during the height of the flood, and the noise of their roots ploughing the rocky bed of the river, as they were borne impetuously along in the swirl of waters, was distinctly audible at a distance of half a mile from the bank

This was the highest flood that had occurred since the year 1859, on which occasion the whole of the lower part of the village had been swept away

The great tug of war had now to be encountered, namely, the ascent of the river from Jatahy to the town of Tibagy, a journey of about 200 miles Two attempts to explore this portion had already been made, both resulting in failure, on account of the torrent-like character of the river one by Mr. Elliott, in the year 1846, and the other by the two Kellers, German engineers, employed by the Government in the year 1865 to survey this and other rivers This section, therefore, still remained unknown and unexplored

The floods having abated, on the 25th of July our small party of nine men, with two new canoes, especially built for this attempt, and amply supplied with provisions, started on the journey, the whole village turning out on to the banks to bid "Farewell" and "God-speed"

The bad character given to the river was not found to be exaggerated On the 27th, notwithstanding all precautions, one of the canoes was swamped, and some provisions lost Continuing the ascent with still greater caution, on the ninth day after leaving Jatahy we were rewarded by the sight of the Indian colony of tame Coroados, called "Colonia Nova" Here fresh supplies met us from St Jeronymo

On once more resuming the journey the river was found to become more difficult than ever. Day after day roads had to be cut through the forest, and the canoes dragged overland, at other times the canoes were unladen, and with the aid of chains and ropes pulled by main force up the foaming rapids The men—six of whom were pure-blooded Caioá Indians—were all far above the average Brazilian, and were one and all imbued with the determination to overcome any and every difficulty.

On the morning of the 20th of August, nearly a month after our departure from Jatahy, this resolution was put to a severe test

The men had already begun to congratulate themselves that the worst of the journey was now over, and that in a few more days the "Campos" would be reached (as that very morning the first sign of civilization had appeared in the shape of a dead cow cast up on the bank), when, on rounding a slight bend of the river, a spectacle came into view which overthrew in a moment all these hopeful calculations.

There, stretching across the whole breadth of the river from bank to bank, and piled up, tier above tier, to a height of more than 100 feet, rose a mighty barrier of rock and foam, waterfall and cataract, mingled together in wild confusion. Here and there wreaths of vapour, like smoke, were rising up from beneath, and forming a cloud upon the summit. The roar of the immense volume of water falling was like deep thunder, and the whole scene impressive beyond description.

On examination this obstruction proved to be 114 feet high, and about half a mile in length. Both flanks were guarded by perpendicular walls of basalt of nearly 200 feet in height, and offered no alternative for the passage of the canoes otherwise than by making a long détour through the forest. This accordingly had to be done, and a timber-road of a mile and a half in length was constructed round the falls, and the canoes were dragged over it, and again launched on the river above.

This operation, which was of a very laborious nature, took nine days to accomplish, notwithstanding the stimulus given during the latter part of the time by the appearance of several wild Indians of the Botocudo tribe. These Indians, however, who only live in very small families together, did not collect in sufficient numbers to give much cause for apprehension, though, from their proverbial brutish and treacherous character, it was necessary to be constantly on one's guard during that time.

On the 1st of September the River Imbauzinho was reached, where further supplies were awaiting our arrival, and on the 8th of the same month we landed once more at the town of Tibagy, having successfully accomplished, though after more than six weeks' incessant labour, a journey till then considered to be almost impossible.

As to the character of the river between Jatahy and Tibagy enough has been already said or implied, but it may be well to mark out the limits of three of the more widely-differing sections into which it may naturally be divided.

From Jatahy to the mouth of the Rio St. Jeronymo, the declivity, though great, is regular, and the river might be considered as one long rapid for the entire distance. Its width varies from 160 to 1100 yards.

From the Rio St Jeronymo up to the "Salto Grande" the river passes through the grand mountain scenery of the Agudos and Apucarana range in a series of bounds over falls varying from 10 to 40 feet in height, and, though more difficult to navigate, the average declivity of its bed is here less than that of the preceding section The average width of the river is also much diminished

The next section from the "Salto Grande" to the town of Tibagy is remarkable by reason of the greater magnitude of its waterfalls proper (as distinguished from rapids or cataracts), and the general occurrence above them of long reaches of deep calm water This section also contains gold and diamonds in some abundance, neither of which were to be found below the "Salto Grande"

The fall of the river from Tibagy down to its mouth is about 950 feet, making, therefore, the total fall, in a length of somewhat less than 300 miles, to be 1550 feet

The exploration which has been attempted to be described, besides fulfilling the special objects for which it was undertaken, has added also one more to the lengthening list of Brazilian rivers whose course have now been surveyed and mapped down

Small and insignificant as the Valley appears on a map of Brazil, yet from its position, connecting the great navigable water-system of the Paranapanéma, Parana, Ivinheima, and Brilhante with one of the best harbours on the east coast (for a first-class carriage-road has already been constructed up the most difficult part of all, namely, the "Sierra do Mar," between Antonina and Curitiba), it is of greater importance than many a larger and richer valley

As has already been seen, it contains within itself every variety of climate, from the temperate to the tropical, and is suitable for the production of all kinds of necessary food It has its pastures for the breeding of cattle, and its rich forest-land for the cultivation of the various kinds of vegetable produce Water and timber abound everywhere, and the climate throughout is unsurpassable in its salubrity

What, then, is wanting in order that these great natural advantages may be utilised? The answer seems plain What is wanting is a more enterprising, energetic, and, above all, honest race to take the place of the mongrel native With this change everything else would follow The Government is already liberal in its support, but as everybody there knows, not one-tenth of the funds supplied ever go to their legitimate object They are, in plain language appropriated by the various officials through whose hands they have to pass.

It is this pervading low standard of morality which has hitherto paralysed, and will still continue to paralyse, the development of the country. Yet, in spite of all, some progress may be observed to be going on, notably in the district round the town of Tibagy.

Now, of all parts of the province of Paraná, this district is the most suitable for the foundation of an English colony. If, therefore, instead of spending thousands of pounds in the attempt to establish an English colony at Assungui—about which we heard so much a few years ago, which place, buried as it is amongst a mass of hills, mountains, and impenetrable forests, is altogether unsuited for its purpose—the same money had been spent in founding the colony on a spot whose progressive capabilities were a matter of certainty, and where ample room existed for its development, much credit might have been saved to the Brazilian Government, and great profit gained by both parties.

The advantages which this district would afford to the English settler over that of Assungui may be briefly summed up as follows:—More suitable climate—pastoral as well as agricultural land—and more central position with reference to markets for produce. If English colonization is ever to succeed at all in this province, it must be planted in some such locality as this, and not in the utter depths of isolation in which Assungui is buried. Let, then, the Assungui attempt be abandoned, and the colony transferred to the neighbourhood of Tibagy, and the nucleus formed somewhere on the borders of the forest, and not in its far depths.

At Curitiba a large and thriving German population has sprung up out of very small beginnings—and why? Simply because the country and the climate are suitable to the people, and there is a market for their labour. At Assungui these conditions are conspicuous by their absence. But at Tibagy they exist to an equal degree with Curitiba, and for an agricultural colony no part of the whole province could be better fitted.

New blood would in this way be introduced where it is most wanted, and where it would have the greatest effect. The laws of natural selection might safely be trusted to do the rest. And thus this rich and fertile valley, with an area of nearly 20,000 square miles, would have some chance of obtaining at no distant day a position worthy its great resources.

At present, it must be remembered, it is, like many another rich but not easily accessible country, scarcely known even in its own province, and to the outside world it is altogether a "Terra incognita."

[The Paper will be published entire, with the author's Map, in the 'Journal,' Vol. xlvi.]

Mr. EDWARDS said he had been employed on the "Paraná and Matto Grosso Expedition," and could bear testimony to the excellent description which Mr. Bigg-Wither had given of the natural features of the country. Unfortunately a great obstacle existed to the navigation between the River Plate and the upper tributaries of the Paraná, namely, the Falls of the Paraná below the mouth of the Ivahy. Just above the Falls the river was 4 miles wide, and at the Falls suddenly contracted to rather less than 70 yards, the waters precipitating themselves in a cascade about 90 feet in height. Above the Falls the river had been proved to be navigable for some distance north of the mouths both of the Ivahy and the Paranapanéma.

The PRESIDENT believed it to be always desirable that geographical exploration should precede colonization. If some such explorer as Mr. Bigg-Wither had examined the country earlier, a colony would certainly not have been formed in a primeval forest instead of on the banks of a river near to some place where a market could be found for their labour. What Mr. Waller had said about avoiding the low levels in Africa applied also to the alluvial flats in South America. As far as his experience went, the people who hated themselves did not love their neighbours, and the way to be philanthropic was to secure a healthy situation, where the energies both of body and mind could be well employed. He trusted that in future, whenever there was a question of fixing a colony in South America or Africa, some scientific explorer would lead the way. Grievous mistakes, which might cost many lives and break up many homes, as they had done before, would then be avoided. It appeared from Mr. Bigg-Wither's paper that three races were mingled together in Southern Brazil, and it did not seem to be a happy mixture. The chief value of the paper, besides its scientific merits, was in the lesson it afforded of the continually extending application of geographical discovery to all the great purposes of civilization. It not only opened a way for commerce and for roads to be made, but it showed where the civilized portion of the race might best make their way into primeval regions.

Mr. W. H. WILLS asked what was the tonnage and size of Mr. Young's steamer, what was the distance from the north end of the lake to the mouth of the Zambesi, and what time would be required to accomplish the distance?

The Rev. HORACE WALLER said the steamer was 50 feet by 10 feet in beam, and of 10 tons burden. She was to have been worked with two boilers, but she was so admirably constructed that Mr. Young found he could get enough speed out of one boiler, and so the other was left at the foot of the cataracts of the Shiré. The distance from the north end of the Lake to the coast was about 700 miles, but the steamer was taken up the Zambesi first, then up the Shiré, taken to pieces at the cataracts, carried over 30 miles of land, and reconstructed above the cataracts. A larger expedition, with two sailing-vessels, started on the 23rd of last month. In the year 1863 Dr. Livingstone had a steamer constructed in Glasgow for the same purpose, but as some of the sections turned out to be of from 3 to 4 tons weight, she had to be sent back to Bombay after reaching the foot of the cataracts. It was important to remember that if any interference took place with the slavers on the Lake, the natives would soon miss the goods imported by the Arabs, and it was therefore necessary that some legitimate trading operation should be opened up at once. The son of Bishop Cotterill had gone out with a quantity of goods, and a boat given him by the Harrow boys, his object being to join Mr Young, and show the natives that there are men willing to buy their ivory and copper, and gum copal, and give them calico in return, but who would resolutely set themselves against dealing in slaves

Fourteenth Meeting, 26th June, 1876

SIR RUTHERFORD ALCOCK, K C B, PRESIDENT, in the Chair.

PRESENTATIONS —*Major K G Henderson, R B Woodd, Esq , R H C Pallett, Esq*

ELECTIONS —*Herbert J Allen, Esq., Edwin William Berryman, Esq , Henry George Bevington, Esq , Herbert Shelley Bevington, Esq., Thomas P Bigg-Wither, Esq*, C E , *Lieut Verney Lovett Cameron*, R N , C B , D C L , *Edwin Cooling, Esq , Colonel John Doran*, C B , *James Forrest, Esq , Richard Gibbs Foster, Esq , Rev. John P Hobson , John Holmes, Esq , Rev William Taylor Jones , Lieut Julian John Leverson*, R E , *Arthur Lucas, Esq* , C E , *Horace Brooks Marshall, Esq , M James Parlane, Esq , John Rideal, Esq , John Hunter Stephenson, Esq , Lieut G Temple*, R N., *Griffin William Vyse, Esq , Rev Barrington B Wale.*

DONATIONS TO THE LIBRARY, FROM 12TH TO 26TH JUNE, 1876 — El Marañon y Amazonas, por Manuel Rodriguez, Madrid, 1684 (*Colonel George Earl Church*) Abhandlungen der k k geologischen Reichsanstalt, Wien, V Heft 3 (*The Institution, in completion of series*) Bulletin of the U S Geological and Geographical Survey of the Territories, II No 3 (*Dr F V Hayden*) Our National Defences, by Admiral Sir W H Hall, 1876 (*Author*) Die österreichisch-ungarische Nordpol-Expedition in den Jahren 1872-1874, von Julius Payer, Wien, 1876 (*Author*) The American Naturalist, Feb —Dec 1874, and 1875 (*Dr. A S Packard, towards completion of series*). Check list of the ferns of North America, north of Mexico, by John Robinson, Salem, Mass , 1873 (*Author*) , and the current issue of publications of corresponding Societies, periodicals, &c

DONATIONS TO THE MAP-ROOM FROM 12TH TO 26TH JUNE, 1876.— Photograph of a design for a Garden, forming a map of the World (*M Jules Chardon*) MS sketch-map of the Akem Country, by Captain J S Hay, Dist Commissioner, Accra (*Author*). MS. sketch-map to illustrate a paper on the Geography of Eastern Turkistan, by Mr R. B Shaw (*Author*)

The PRESIDENT, in referring to the first Paper to be read, reminded the Meeting that it had been lately called in question whether the Albert Nyanza was directly connected with the Nile, for the actual communication had never been traced Thanks, however, to Colonel Gordon and the enterprise of those under him, boats conveyed several years ago by Sir Samuel Baker to Gondokoro on the White Nile, and left there by him, had been launched upon the Lake, and had thus settled the point which neither the Egyptian, the Ptolemaic Geographers, nor any succeeding nations, had been able to clear up The Nile had now been distinctly traced into the Albert Nyanza, and that lake had been circumnavigated When Sir Samuel Baker was upon it, he saw towards the south only a water horizon, and with the natural tendency of the human imagination to extend all that is unknown, it had been laid down on maps as much longer than it really was, but *en revanche* it would be remembered that at the last Meeting it was announced that Lake Nyassa stretched 100 miles farther north than was supposed, so that what was lost by one lake was gained by the other

The following was then read by the Assistant-Secretary —

Letter on the Circumnavigation of Lake Albert Nyanza By General STONE, Chief of the General-Staff, Cairo

Ministère de la Guerre,
Cairo, June 10, 1876

DEAR GENERAL RAWLINSON,

An Arabic despatch (telegraphic) from General Gordon Pacha, dated 29th April, 1876, seems to state the following —

"On the 8th of March, Mr Gessi left Duflé with the two iron life-boats and the steamboat *The Khedive*, with their crews, numbering twenty-two officers and men, with their arms, ammunition, &c, carrying also certain other supplies

"They went to Magungo to make the reconnaissances already indicated to his Highness as to be made.

"They arrived at Magungo (which is indicated on the map of Baker Pacha) on the 31st of March There they missed the way, and returned to the island of Fori, known as the Cataracts of Aufina. • There they were met by Mohammed Aga-Wat-el-Mek, accompanied by several officers and soldiers, and the Chief Aufina. After the proper ceremonies of reception were over, they raised and saluted the flag of the Government

"After several days of rest, they left and went to Magungo, where they arrived on the 12th of April; and on the same day they hoisted the flag there, on the banks of Lake Albert, in the presence of the officers, soldiers, and natives, and all the assemblage prayed for long life and continued victory for his Highness the Khedive, and the Princes, his sons, and all those regions and their inhabitants came under the rule of the Khedival Government.

"Mr Gessi left Magungo on the 15th of April, with the two iron boats, to explore Lake Albert, and did not stop until he reached its extremity On the 19th of April he was able to state that the Lake is 140 miles long with a width of 50 miles, but he was not able to make the entire circuit of the shore He states that the Lake is bounded on the south by great trees (forests?), and that in that portion the water is only leg-deep, that it is bounded on the west by high mountains and great forests, so that passage there was impossible

"On the east there is a river which empties into the Lake, but the forests form an obstacle to its ascension, and the current is so strong that it could not be navigated without great danger

"By the next mail I will transmit a map of this reconnaissance and the corresponding reports to be laid before his Highness the Khedive

"P S—Mr Gessi, in going beyond Magungo, was accompanied by the Ensign Said-Aga and twelve soldiers"

The above telegram tells us much, but the report and map therein promised will soon be here, and then we shall have something more satisfactory than a twice-translated telegram.

With great respect, I remain,
Dear General Rawlinson,
Very truly yours,
(Signed) C M P Stone

Major-General Rawlinson, London

The PRESIDENT said the Albert Nyanza was first heard of by Captain Speke in 1862, and was introduced into his map under the name of the Luta Nzige He laid it down as a small lake compared with the Victoria Nyanza It received its present name from Sir Samuel Baker, who, at the instance of Speke, visited the Lake and embarked on its waters He (the President) had received a letter from Sir Samuel Baker bearing upon the subject, which he would read to the Meeting

MY DEAR SIR RUTHERFORD, 25th June, 1876

Mr Bates has kindly forwarded me the news our Society has received of Mr. Gessi's voyage upon the Albert N'yanza in the steamer which cost me so much trouble in conveying from Alexandria to Gondokoro, together with the two steel life-boats, in 1870

The difficulties that Colonel Gordon has experienced for two years in transporting them over the comparatively short distance between Gondokoro and Appuddo is a proof of the impossibility of effecting a great enterprise in Africa without much patience and delay.

It is a great triumph for the Khedive of Egypt that such a feat should have been accomplished during his reign, and, as I originally planned the expedition, I am truly gratified at the present result, which proves the accuracy of the discoveries of Speke, Grant, and myself.

You will remember that upon the map which poor Speke gave to me when at Gondokoro (and which I delivered upon my return home to the Royal Geographical Society) he had very correctly laid down from the hearsay of natives the position of the Albert N'yanza, and of the White Nile issuing from its northern extremity. Upon that portion of the river between the embouchure and Appuddo, N. lat. 3° 32′, Speke had written, "River navigable here."

Although I never actually passed down that portion of the Nile from the Lake, I saw sufficient during my first expedition to feel justified in asserting positively that Speke was correct, and that no obstructions existed between 3° 32′ N. and Magungo on the Albert N'yanza, lat. 2° 15′ N.

Upon this conviction I based the arrangements for the Khedive's expedition, and the steamers and boats were to be carried in sections above all cataracts, and constructed on the navigable Nile at N. lat. 3° 32′.

Many cavillers asserted that the Nile did not issue from the Albert N'yanza, therefore the Lake could not be reached by the river from Appuddo.

Dr. Schweinfurth, as President of the Egyptian Geographical Society, only recently published this opinion. The steamer and two large sailing-boats have now passed direct from Appuddo to the Lake, as I always asserted they would.

The following short extract from the 'Albert N'yanza' will recall to the memory of many who may have forgotten the opinions I then expressed:—

"The newly-discovered Albert Lake opens the centre of Africa to navigation. Steamers ascend from Khartoum to Gondokoro in N. lat. 4° 55′. Seven days' march south from that station the navigable portion of the Nile is reached where vessels can ascend direct to the Albert Lake."—2nd edition, p. 445.

My definition of the two lakes of the Nile was as follows:—

"The Victoria gathers all the waters on the eastern side, and sheds them into the northern extremity of the Albert, while the latter, from its character and position, is the direct channel of the Nile which receives all waters that belong to the Equatorial Nile Basin Thus the Victoria is the first *source*, but from the Albert the river issues at once as the great White Nile"—2nd edition, p 439

I have always considered that if Speke had not assisted me by the gift of his invaluable map when at Gondokoro, I should never have succeeded in the discovery of the Albert N'yanza. He was wonderfully correct in the information that he obtained, and the great success of the present is a result entirely due to the pioneers Speke and Grant, who first opened the road to the Nile sources

Very sincerely yours,

SAMUEL BAKER

The PRESIDENT continued When it was recollected that only fourteen years had elapsed since Speke first heard of this lake, and that now it had been actually circumnavigated, no complaint could be made that the progress of Geographical discovery was slow in our days He had had no hesitation in reading the letter, because it contained a just and generous recognition of the great services of the previous travellers, and was no less honourable to him than to them A letter had also been received from the Foreign Office, which would now be read, as it gave authentic intelligence regarding Colonel Gordon's recent movements And here he would remind the Meeting that the chief merit of the circumnavigation of the Albert Nyanza was not so much due to M Gessi as to Colonel Gordon, who planned the expedition and made it possible He would take this opportunity of informing the Fellows that he had received a letter from Her Majesty's Treasury announcing that the Government had granted a sum of 3000*l* towards meeting the expenses of Lieutenant Cameron's Expedition The Fellows must feel very grateful to the Government for thus having come to their aid in an undertaking which had been very costly to the Society.

The following was then read —

SIR, Foreign Office, June 22nd, 1876.

I am directed by the Earl of Derby to request that you will communicate to the President and Fellows of the Royal Geographical Society the following summary of information which has reached Her Majesty's Government in regard to the movements of Colonel Gordon, and the results of his recent expedition to the neighbourhood of Lakes Victoria and Albert, in Central Africa

According to the latest intelligence received in Cairo, Colonel Gordon has penetrated as far as the banks of the River Somerset, in the district of M'rooli

A station has been established at Masindi, the capital of Unyoro, the king of which country, Kaba Réga, who had invariably shown himself hostile to the Egyptians, has been obliged to seek safety in flight

Aufina, the rival of Kaba Réga, has been called to succeed him as representative of the Egyptian Government.

Rionga, who had been expelled by Kaba Réga, and who for many years past had sought the protection of Egypt, has been re-established at M'rooli in a capacity similar to that of Aufina at Unyoro

The surrounding native population is represented to be quiet and submissive.

Colonel Gordon has despatched a body of troops under the orders of Nom Agha, a trustworthy officer well acquainted with the country, with the design of establishing two military posts, the one at Urondogani, and the other on the borders of Lake Victoria, near the Ripon Falls.

He has occupied the position of Magungo, on the banks of Lake Albert, near the mouth of the Somerset River, and established communications between Magungo and Duffle, a station on the White Nile, near the mouth of the River Astesa, where the iron vessels and a steamboat have arrived.

In this manner all the territories surrounding the Victoria and Albert Lakes have been annexed to Egypt, these lakes with their confluents and the River Somerset opening to Colonel Gordon a vast field, which he is understood to be about to explore with as little delay as possible.

Lastly, he is said to have expressed the hope that within a year or two from the present time the means of communication between the different stations which he has established will be sufficiently secure to allow both merchants and travellers to traverse the country in perfect safety.

I am, Sir, your most obedient, humble servant,
(Signed) T. V. LISTER.

The Secretary of the Royal Geographical Society.

The PRESIDENT said no doubt the concluding portion of the letter would appear to many a very sanguine estimate, but when it was considered what great things had been done within the last three or four years, even since Livingstone ended his life in the effort to open up Central Africa, how much Stanley and Cameron had accomplished, and Mr. Young was still doing on Lake Nyassa, it really seemed no dream of the imagination that within a very few years, if the necessary efforts were made, it might be possible to traverse Equatorial Africa from the Congo to the Zambesi, and establish stations upon each of the inland seas from whence might radiate all the blessings of civilization.

Colonel J. A. GRANT said he was delighted to hear of the great success which Colonel Gordon had met with, and he knew from his own correspondence that his efforts had been untiring to get the steel boats and the steamer up to Duflé, where the cataracts of this section of the Upper Nile cease. Although Captain Speke did not visit the Albert Nyanza, he obtained its bearings from the chiefs so far south as Karagwe, and from those on the north of Victoria Nyanza, and he was thus able to lay down its position and size to within 30 or 40 miles of Gessi's circumnavigation. He could not say that he put much confidence in M. Gessi's measurement, at present, for Lieutenant Watson, who had been with Colonel Gordon, had told him that probably the rate of travelling by boat would be the only means by which M. Gessi determined the size of the Lake. Colonel Gordon had now completed a chain of military posts all along the Upper Nile from Gondokoro to the Albert and Victoria Lakes, so that now there was postal communication all the way from London, and a gentleman near him had said that no doubt Cook's tickets would soon be issued for trips to the Albert Nyanza in seventy-five days, within which limits it was stated by Colonel Gordon to be possible now to reach it. He, however, rather doubted the statement of the last letter as to the perfect safety of such a trip. He thought Captain Speke was quite right in regarding the Albert Nyanza as merely a backwater of the Nile, formed by the floodwaters from the Victoria Nyanza filling the plain and then descending in full stream to Gondokoro. That this was the case was proved by the fact that on reaching Gondokoro two months after seeing the river in high flood below the

Victoria Nyanza, Speke and he found that the water had not then got down so far as Gondokoro. It must therefore have been retained in the Albert Nyanza as a backwater, or as an enlargement of the Nile at this particular spot, for the Albert does not add any perceptible quantity of water to the Nile which flows from the Victoria Nyanza. The native name of Loota-Nzige, signifying "Dead Locust," indicated to him that the waters of the Lake had the character and appearance of dead or backwater.

Lieutenant Cameron said he met at Nyangwé and elsewhere many men who had been on the Mwuta 'Nzigé (as they termed it), and from their reports he had gathered that the Lake was not of such great extent as Baker had marked it on the map. The Arabs of Nyangwé stated that after about thirty-five days' marching N.W. by N. they came to extensive forests, in which they travelled for days without seeing the sun, and there they heard of people wearing white clothing, who were, no doubt, the Egyptians working down from the north, but they heard nothing of the Lake. On his maps he had pencilled down his idea of the Lake from these reports, and he found that it corresponded almost exactly with Speke's description.

Mr. F. Galton asked if the Lake was widely known by the name of Mwuta 'Nzigé.

Lieutenant Cameron said the Arabs always spoke of it by that name.

Mr. F. Galton said if that was the case it seemed almost a pity that so well-known a native name should be superseded on our maps.

The President believed that all would agree in considering it very undesirable to change a native name, but the change had already been made, and it would now be difficult to alter it back again.

Captain Hay was then called upon to read his Paper:—

On the District of Akem, in West Africa. By Captain J. S. Hay.

[Extracts.]

During the late war between the Asantis and Djaubins, in the latter part of 1875, I received orders from the Governor of the Gold Coast to take command of the field-force sent up to the frontier of the British Protectorate, to prevent the neutrality of our territory being violated by the Asantis, the Djaubins having been driven to take shelter in our territory of Akem. Starting from Accra, on the 17th of November, I reached Kyebi, the capital of Akem, after five days' heavy march, having walked 150 miles chiefly through mud and water, on the 21st, and here, during a period of three months, I had occasion to make my headquarters. Having thus had ample opportunity to make myself acquainted with an interesting district—hitherto almost unknown and unexplored, I have undertaken to describe as clearly and briefly as possible what I was able to observe during my stay.

The District of Akem, in West Africa, lies between 6° and 7° north latitude. A series of mountain ranges, densely covered with primeval forests, occupy the whole extent, except a small portion of the south-east, and a still smaller portion of the western part. The towns and villages are mostly situated on or near the tops of the hills In the larger level district of the south-east are only two small towns, viz, Osaneaśe and Asâmang, the remainder of that portion, with the exception of a few sparsely scattered hunters' huts, being totally uninhabited

Having described one of these towns I shall have described all, as they scarcely vary at all in appearance As one wends one's way through the trackless forest, no outskirts or other sign mark the approach to a scene of human life and habitation We come upon them all at once, without the slightest notice or indication They are hidden from sight by the primeval trees until they are actually reached They generally consist of one long straggling street, the houses are constructed of bamboo frame-work, held together by wood-fibre, and thatched with palm- and plaintain-leaf The side walls are plastered with mud over the frame-work, and very rarely have windows or apertures They are entered by a side door, leading into a courtyard, where the culinary operations, such as they are, are performed, the rooms, which are very small and low, being distributed on the three sides of the courtyard In the centre of the town there is generally a fetish-tree, supposed to be inhabited by the local deities, and two trees, one at each end, with rude benches or logs of wood at their feet, where the kings and chiefs hold their "palavers" and receptions

The whole country is well watered, the principal rivers being (1) the Berem, (2) the Densu, (3) the Bompong, (4) the Pompong The channels of these rivers are never dry, receiving constantly a supply of water from the mountain ranges, and being also frequently swollen by rain Owing to the presence of numerous small waterfalls and shoals, they would only be navigable by light canoes, though these even are not used by the natives, who have no commerce, and are too indolent to create any

Having thus described the leading features of the Geographical position of Akem, I now come to the second part of the subject, viz., the characteristics of its soil, its timber-woods, mineral and vegetable produce, and peculiarities of climate

The entire country of Akem is auriferous in a high degree, the natives, however, are too ignorant and too lazy to work the gold properly, and content themselves with digging circular holes, from sixteen to twenty feet deep, to obtain it, in the shape of small nuggets and dust—the latter being also found in the rivers and watercourses, where I have myself seen them washing it The country is honeycombed in some parts with these gold-holes, which makes walking a difficult, and sometimes dangerous operation The soil is a heavy, tenacious red clay, quartz strata and red sandstone cropping up in every direction The country is rich in timber-woods, which grow to immense height and girth, some I have myself seen over two hundred feet high. The forests being left in their primeval state, all cultivation is rendered impossible. With a very small amount of activity and intelligence, however—were the forests cleared in the neighbourhood of the towns—the soil is so rich as to be capable of growing cotton, rice, ginger, and coffee (not to speak of other products), in any quantity. As it is, in spite of the sloth of the natives, the palm-tree flourishes luxuriantly, and were it cultivated in plantations, the oil would prove a rich staple of commerce with the Coast. The tobacco-plant grows wild in rank luxuriance, untended and unused, the natives purchasing from the coast for their own consumption supplies of the prepared leaf sent from America

In the neighbourhood of Begoro, the most northerly town in the district, are innumerable gum-trees and india-rubbers, and both might prove a fertile source of wealth, had the natives enough human intelligence and industry to avail themselves of the treasures which Nature showers upon them with so lavish a hand

The climate of Akem is throughout the year humid. During the three months of my stay there (from November to January), in what, by comparison, is called the dry season, no day passed without rain, which generally commenced in the afternoon, accompanied by heavy thunder and lightning

I come now to the third and concluding section of my subject, viz the personal appearance, habits, manners, language, and religion of the natives. The men are generally of medium height, and the women well formed, but short, of lighter colour than the Coast-tribes, with less of the negro type The males are of slight build, but capable of undergoing great fatigue when they choose, but they are so incorrigibly idle, and so addicted to drunkenness whenever they obtain rum in sufficient quantities, that they for the most part leave all the work to the women, who forage for their food, collect branches for fuel, and wash the gold from the streams Amongst the men I have frequently noticed an extraordinary growth or enlargement of the cheek-bones under the eyes. These take the form of horns on each side of the nose, and so long do they become, that I have seen instances in which the man had to squint violently in order to see at all. The growth begins in childhood. The skin is not broken in any way, but seems to stretch over the horns like a glove This phenomenon is, I believe, peculiar to the tribe, having noticed it in no other.

Food.—They are very partial to palm-oil (which, however, they can rarely obtain, as they are too idle to cultivate it), taking it in the form of soup, with snails' or monkeys' flesh. Their ordinary dish is called "Fou-fou," and consists of green plantains boiled and beaten to a pulp by a bough, in the hollow of a cotton-tree, a little cold water being mixed with them. Of this they consume enormous quantities, after which they frequently fast for twenty-four hours. They sometimes *roast* the plantains over a wood-fire.

Marriage Customs.—These are curious and interesting. They are, of course, polygamists, and a man is counted rich in proportion to the number of his wives. Instead of receiving a dowry from the family of the bride, the candidate pays a price to the father, varying from *5l.* to *10l.* in gold-dust, besides "dashes" of cloth and rum. The only exception to this rule is the reigning chief of the district, who has the power to demand the daughter of any man without the customary payment. The present King of Eastern Akem has about thirty; but some of these are well-stricken in years, it being the custom when a king ascends the "stool" for him to retain the principal wives of his predecessor. The present King, who, in accordance with the line of succession, succeeded his uncle, has a number of the late King's wives in the harem. A daughter of the royal family in all the tribes can propose to any man, and he cannot refuse to accept her—generally on pain of death. When a princess chooses a peasant, which is sometimes the case, the latter is at once made a chief. He is, like the rest, allowed to take other wives; but if the princess conceives a dislike to any of them she has merely to order him to send them away, and he is compelled, on pain of death, to obey. They have also the privilege of divorcing their husbands, without appearing before any tribunal, presenting them simply with a piece of white clay as a token of dismissal. The common people have to appear before the chiefs, and get the case settled by them. If they grant the divorce to the woman, her family retain her dowry, and the chiefs present her with a piece of white clay, with which she marks all the trees in the principal street, to show she is no longer a wife. If they grant it to the man, the wife's dowry has to be returned by the family.

With the exception of the few who are engaged in hunting, and who stay out for a week or more in the forests on the bare chance of shooting a leopard or deer, the large bulk of the male population follow no regular occupation, but dawdle or sleep about the towns and villages while the women are at work. They retire within doors at dark, which occurs at much the same period throughout the year. They have a great dread of going out again after dark, and if the King in his rambles with his officers, when he goes out to see that everything is right, catches any of them abroad, they receive a flogging, as it it is assumed they cannot be out for any good purpose, and the evil spirits of the night are supposed to be abroad

Religion.—The following are some of the principal features of their religion, as obligingly communicated to me in writing by the Rev David Asante, the native missionary The idea generally prevalent among Europeans respecting the fetishism of the people of the Gold Coast is an entirely erroneous one. Their religion is popularly supposed to consist merely in the worship of pieces of wood and stone They are assumed to know nothing at all about an overruling God and Creator All this is very wide of the actual fact They have, it is true, a multiplicity of deities, although their worship even of these differs very essentially from the common notions current about it, as will be presently shown. But long before the Christian doctrine was brought to their country they entertained a clear and remarkably developed idea of the one supreme God, whom they hold to be the Creator and Preserver of all things, who is omnipresent in the visible firmament, which they consider as a part of his immense and boundless being He is all-knowing, all-seeing, and all-hearing, but invisible to man in his personal form. Being without either birth or death, he is neither old nor young He is the father, and earth the mother, of the universe If he kills, nobody can save, if he saves, nobody can kill He determines unchangeably and irrevocably the fate of every individual before his birth hence the proverb or adage of the Chwee people "Fate is an unchangeable determination" They call him *Anyankôpong*, a name never given to any of the minor deities, nor pronounced in the plural form Him they hold to be not only the Creator of all inanimate things, but also of the invisible spirits in the air, who, as he dwells too far from man himself, are the medium of communication between God and man, the punishers of evil and the rewarders of good deeds These spirits are of three kinds or orders two being personal, and a third impersonal, but, nevertheless, possessed with a certain power to effect good or evil in answer to prayer Of this third or impersonal order are the amulets worn on neck, leg, or hand, and set up in houses. The minor fetishes or spirits who form the second order, apparently created in imitation, or derived from the elder one of the original great fetishes, have their abode chiefly in odum or cotton-trees, and sometimes in a wooden bowl or brass pan, filled up with a mass of clay and leaves These minor fetishes have priests who act as their interpreters, make known their will to man and dance publicly before the populace They also are revered as soothsayers, and to them the people resort for advice in cases of sickness and misfortune In the former they are especially useful, for, possessing generally a pretty good knowlege of herbal effects, they act as the chief doctors in each village When any one is chosen by one of the minor fetishes as his priest or priestess, the person chosen jumps about as if mad or possessed, abstaining from food and drink, and even from speech, till the name of the fetish is found out by an elder priest The minor fetish being discovered, receives local habitation by being placed into a bowl or brass pan, whereupon sacrifices are brought to it The newly-appointed priest is then given in charge of an elder one, with whom he stays for three years to receive instruction in his office They are always chosen young, and during this period of tuition are not allowed to marry They are bound to remain unshaven for the rest of their lives This priesthood is not hereditary. When a priest or priestess dies, the fetish whom they served may select a new one to succeed them from any family except that of the King. The ordinary sacrifices offered to the minor fetishes consist of sheep, goats, dogs, fowls, yams, and drink-offerings of all kinds. Besides the great annual feasts, these sacrifices are made on certain days of every week, or as often as the people bring them The first order, viz, the great fetishes or spirits, seem, however, in all probability, to have been the original deities of the Chwee people, or people of the Gold Coast They are not worshipped in images, nor confined in bowls or brass pans, like the minor fetishes or spirits, nor are they even supposed to take up either a permanent or temporary abode in trees, but are believed to dwell in rocks, caverns, groves, and other wild and romantic places They are accredited, to a certain degree, with the same qualities as the great God or Creator They are invisible even to their priests, being seen only on the rare occasions when they appear to terrify some evil-disposed person to death, or to avenge in kind some cruelty a mortal has attempted to commit on them, unwitting who they were Otherwise they marry, beget children, and do almost everything that human beings do These great fetishes do not choose their priests from among the people, as the minor fetishes do Their priesthood is a separate order, and is hereditary, being of much the same nature and character as that of the priesthood of the Old Covenant. They neither dance publicly nor act as soothsayers, like the priests of the minor fetishes They are consecrated on succeeding to their office by an elder priest in the presence of others. A sacrifice is brought to the great fetish whose priest is thus newly called, and the consecrating priest offers with it a prayer to the following effect, invoking the fetish in question by his name, and naming also his new minister —"God Earth Great Fetish ———, I now consecrate thy son ———, to be thy priest. Grant unto him a large family and much wealth Protect him and them from all evil. Bless his friends and well-wishers, and curse his enemies that wish him evil Give him eloquence in offering his prayers in all sacrifices," &c , &c

The chief duty of these priests is to bring sacrifices on certain days of the week to their respective great fetishes, and to accompany each with the appropriate prayers appointed for the occasion, in which they have to be thoroughly conversant Their usual sacrifices consist of bullocks, sheep, goats, and palm wine The beasts thus offered must be without blemish or spot, and if they are females, must not be in a state of pregnancy There are places of sacrifice in the dwellings or courtyards of the priests where they offer only drink-offerings, but other offerings, which are always connected with drink-offerings, are brought to the respective localities or habitations of the fetishes These places are never approached, not even by the priests, without a sacrifice, which is offered on an altar of unhewn stones On the day of offering, the priest is to abstain from woman, and from all animal food Should he happen to touch either, whether wittingly or unwittingly, he is polluted and rendered unfit to offer a sacrifice on that day These priests are not allowed to marry a widow, and are strictly prohibited to touch a dead body After attending the funeral custom of a friend or relative, a priest must be sanctified in the evening with consecrated water, to be sprinkled over him three times by himself or by another priest of his order He is also exempted from fasting, even on the death of his nearest relative. These priests are classified according to the importance of their respective great fetishes, and do not all enjoy the same privileges The high priest is the priest of the highest or most important great fetish He has more power than the chief of a town or district, nay, in some respects, even more than the king of a whole country. His orders must be unhesitatingly performed, for disobedience to his will is equivalent to disobedience to the great fetish whom he serves Maltreated slaves can obtain their freedom by invoking any of the great fetishes They make a certain sign, and call on the great fetish by name to accept them henceforth as *his* slaves.

The priest, or high priest, then sprinkles the slave with consecrated water, and he is made free, or rather is the slave of the fetish alone, with whose priest or high priest he can remain if he chooses, or depart whithersoever he will Such are the chief points of the religion of the Gold Coast

[This Paper will be published entire, with the author's Map, in vol xlvi of the 'Journal.']

The **President** said every one must have listened with interest to the Paper, as it gave a great deal of novel information about a tribe of whom nothing was previously known He was sorry that the exigencies of time prevented a discussion on the subject

The Assistant Secretary read the following Paper —

A Prince of Kâshghar on the Geography of Eastern Turkistan

By R B Shaw

[Abridgment]

The interest attaching to the mountain region surrounding Kashgharia, of which portions have been recently brought to notice by the explorations of the several parties detached by Sir T D Forsyth's Mission, makes it worth while to review what we know of the remainder, so as to ascertain how much has still to be done before our knowledge is complete

I have been chiefly led to do this by reading the graphic account of these regions given by Mirza Haidar, a Prince of the Royal family of Kâshghar, and a contemporary and connection of the Emperor Baber, the first of the Great Moguls of India Moreover, though I have not had an opportunity of making any personal explorations in the hill-country west and north of Kashgharia, beyond the determination of the position of several peaks and ridges visible from the plain-country, still I have been able to cross-examine several intelligent natives who have been there, and I have formed to myself a pretty definite notion of some of the natural features, subject, of course, to subsequent correction

Mirza Haïdar thus describes the general characteristics of the region —

"The mountains of Moghulistân [the Muzart and Thian-Shan Range], from which all the other mountains branch off, passing round the north of Kâshghar, come round to its west, and go off by the south of that city The province of *Farghâna* [Andijan or Khokand] is in the west of Kâshghar, and these same mountains lie between; and that which is between Kâshghar and Farghâna is called Alai

"*Badakhshân* is on the west of *Yârkand*, and there also these mountains intervene That which lies between Yârkand and Badakhshân is called *Pâmir* The width of Pâmir is, in some places, seven or eight days' journey When one has passed this, there are some of the mountains of Yârkand which adjoin *Balor*, such as *Raskam* and *Tâghdumbâsh*, and when one has passed these, the rest is land belonging to Tibet"

Here we must remember that the writer is in imagination travelling with the mountains, following their curve as above described, which leads him first into the Alai plateau, then into the Pâmir, thence into a region where Balor is conterminous with the districts of Raskam and Tâghdumbâsh, and finally into the Tibetan provinces This is quite a correct account

Mirza Haidar continues —

"Badakhshân is in the direction of summer sunset [viz about 30° N of W for that latitude but the real direction is nearer west, in accordance with his first statement] from Yârkand, as has been mentioned

"*Kashmir* is in the direction of winter sunset [south of west, but in reality it is very little to the west of south] from Yârkand, and the same mountains lie between That which lies between Yârkand and Kashmir is a province of Tibet, called *Balti*.

"Similarly in the winter sunset [south of west] of *Khotan* certain of the cities of India are situated, as *Lahor* and *Sultânpur* and *Bajwâra*, and the same mountains before-mentioned lie between That which lies between Khotan and the cities of India above-named forms provinces of Tibet, viz, *Arduk* [Rudok], and *Gugah* [Gugé], and *Aspati* [Spiti] And this must be borne in mind, that these mountains end in Khatai [China]"

Here we have a geographical description which shows that Mirza Haidar was able to rise above details and conceive a general idea—a rare faculty among Orientals The account of the mountain region sweeping round the north, west, and south of Kâshgharia, and thus enclosing that country on three sides, is the simplest and truest that can be given Our author evidently considers all that lies between Yârkand and Khotan on the one side, and India on the other, as one great mountain mass, in the same way as that which divides Yârkand from Badakhshân, or Kâshghar from Khokand, only, the mass widens as it runs round by south and east He is not troubled by any theories about the mountains of Sanju (the Kuen-Lun) not forming a part of the same mass This mass is composed of many subordinate ridges, but they combine to form one grand system No one of these subordinate ridges or ranges (such as the so-called Kuen-Lun) deserves to be distinguished from the general system, in any sense in which each of the others could not equally be distinguished from the rest. Looked at individually, they are ranges distinct from one another, but viewed *en masse*, they all (including the Kuen-Lun) form but one system or chain.

The idea of gauging the width of the chain by giving us lines across it in different parts, together with a statement of the countries which they lead to, is very satisfactory. These lines, radiating from the cities of Eastern Turkistân, are probably routes travelled by himself or by his informants.

With regard to the first of these, viz., that *from Kâshghar to Farghâna*, he merely says that it crosses the Alai, and that the Alai is narrower than the Pâmir, which is seven or eight days' journey in width. I have obtained some information regarding one of the routes between Kâshghar and Khokand, which does, in fact, cross the Alai, and which, I think, has not yet been described. I have drawn up the accompanying sketch map from the description and under the eyes of a very intelligent native merchant who has traversed it, and who, knowing the kindred region of Tibet well also, was able to point out to me examples in the latter country of the natural features of the Alai, which he was trying to describe. The position of the northern Passes I have taken from Colonel Walker's last map.

The lamented Fedschenko has made us acquainted with a more westerly part of the Alai, "a table-land at the head of the Surkh-âb, or northern arm of the Oxus. At the point at which M. Fedschenko visited this plateau it was about 7 miles wide and 8000 feet high, towards the east there are no mountains visible, and the plateau seems to widen out towards the north-east. On the south, the Alai is skirted by a snowy range . . . Across these mountains, which M. Fedschenko calls the Trans Alai, there is a pass into Sarikol, and further east there is another pass, called *Taû Murun*, which leads to Kâshghar." He himself crossed a range which bounds the Alai on the north by a pass of 13,000 feet.

Now it is across this same range farther east that the *Shart* Pass leads (the *Terek*, or main route, between Khokand and Kâshghar, being still farther east). On crossing the Shart Pass from the north, one enters the flat Alai plateau, which is here described as a day's march across (say 12 or 15 miles). At first small rivulets are met with, running west, to form the river Surkh-âb, or Kizil-su, seen by Fedschenko. Crossing the plain transversely (south-east?) towards the southern snowy range, one gets to the edge of a sudden depression running along at the foot of the southern mountains, like a ditch under a rampart, with the Alai plain for a "glacis" In this depression is a small stream running *east* and coming from the *west*, where the depression itself seems to originate only a few miles off, being, in fact, a kind of fissure between the plain and the mountains

Another road across the western mountains is given by Mirza Haidar in a separate passage, in which he describes the rivers of Kashgharia It lies up the valley of the *Shahnâz*, and leads from Kâshghar to Badakhshân This introduces us to the question of the drainage of the mysterious region north of that which was the scene of Colonel Gordon and his party's late spirited and valuable exploration, and south of the Alai, and also to that of the origin of the streams which one crosses between Kâshghar and Yârkand I give the passage from Mirza Haidar which refers to this subject —

"When I say that the length of the cultivated country of Kâshghar and Khotan extends along the skirts of the western mountains, so that from the borders of Kâshghar to the extremity of Khotan may be one month's journey, still, in the width of the inhabited portion, if one travelled quickly from the Western Mountains in an easterly direction, one would pass out of the cultivated country in one or two days

"By the side of every river that issues from the mountains corn is sown and the land inhabited Thus the first river is *Tuman* It comes out from the mountains which lie between Kâshghar and Farghâna (Andijân) And this river passes through the midst of the old fortress which Mirza Abu-Bakr destroyed . . . Many districts are fertilised by this water

"The second river is called *Kara-Tazghun.* It passes the abovementioned fortress three farsangs (15 miles) to the south, and most of the districts of Kâshghar are cultivated by means of this water.

"Three farsangs from this river is another, the *Kusan* Tazghun The villages of *Yangi-Hissâr* are on this river, and the lands of these villages are irrigated from this water From Kâshghar to Yangi-Hissâr the road is six farsangs.

"After Yangi-Hissâr there is an insignificant hamlet called *Kara-Khanak* It may be about six farsangs In front of it flows the river *Shahnâz*, and several villages are fertilised by this water. Shahnâz is also a valley situated in the Western Mountains, and the road from Kâshghar to Badakhshân is through that valley

"From Kara-Khanâk to *Kilbin-Rabât* there are villages which are stages for goers to and fro It may be five farsangs Then there is another rest-house, which they call *Kosh-Gumbaz* It is a fine halting-place, and irrigated by the River Shahnâz It possesses cultivated fields and gardens, which are all assigned to the service of this rest-house Goers and comers have the use of this rest-house

"The next stage is a village called *Kizil.* It has salt-water At this stage they do not halt unnecessarily This is the half-way stage between Yangi-Hissâr and Yârkand"

With these two descriptions before us, viz, Mirza Haidar's, written three centuries ago, and that of the present features of the road given in the notes, we see the water distribution which we have to account for. There is one strange thing about it that streams crossing the road several miles apart are often said by the natives to be one and the same, and on further inquiry one learns that they are derived from a single trunk stream Thus the Telbachuk, the Faizabad, the Kizil Boi, and the Karasu, I was told, have one origin, which is said by some to be identical with that of the Kâshghar rivers, and Captain Biddulph, in the interesting account of his visit to Maralbashi (see Royal Geographical Society's 'Proceedings,' vol xviii), mentions "three considerable streams flowing from the south," whose names were given to him as "the Derbuchk" (my Telbachuk), "the Chokanah" and "the Faizabad" He was told "that they are all united into one stream called the Yamânyâr, at no great distance above where I crossed them" Thus it would seem that all the streams crossing the Kâshghar and Yârkand over a space of, at the least, some six miles, beginning from the Fort, are derived from one parent trunk, whose proper name we may conclude to be the *Yamânyâr*, as stated to Captain Biddulph, notwithstanding that my own informants applied the name more particularly to the northern branch

Thus the natural rivers of the country seem to have disappeared or become merged in the number of artificial water-courses or canals into which they have been distributed by the industry of the children of the soil. And instead of finding the streams diminishing in number and increasing in volume as we follow them downwards, it is the reverse that takes place There is complexity below, and unity above They resemble arteries rather than veins, though, of course, in the mountains the case is the reverse

As we leave Kizil and travel towards Kok-Rabât, the secret of this curious state of things begins to reveal itself The skirts of the mountains are here nearer the road than before, and the desert, sloping down from the low outer hills on our right hand, begins to exhibit, on a scale not too large for comprehension, a surface-formation which is common in Tibet, where it can be recognised and studied with greater ease than here This formation has been most graphically described by Mr F. Drew, F G S, in a Paper read before the Geological Society in August, 1873 He has given the name of "alluvial fans" to these deposits of loose material (a sort of convex deltas) brought down through narrow ravines and laid out on the flat land outside their mouths.

With regard to the desert slope on the road from Kizil to Kok-Rabât, I can best characterise it by saying that it consists of a series of fans such as that described by Mr Drew, only they are on a much larger scale, and (as generally follows) with a gentler inclination

Now it is probably this fan formation, and the radical direction of the water-courses caused by it, which enables the water issuing from one ravine-mouth to embrace in its branches wide tracts of country For example, after leaving a certain ruined Chinese post-house, situated in one of the triangular flats between the fan edges (near the well and rest-house of Aklangar), one rises up the slope of a fan which is seen to come from a remarkable ravine-cutting in a low range of outer hills to the south-westward After traversing this fan-undulation for about 7 miles, one reaches the bottom of another trough, marked by a dry water-course, which is distinctly seen to come from the same unmistakable cutting, away to the west. So that when the water flows in spring (if it ever does here) the depression in which stands the Chinese post-house, and that near Kok-Rabât (some 7 miles apart), must be supplied with water radiating from one and the same spot

If we judge by analogy, we shall conclude that in the other instances where we see the same result, viz, widely separated water-courses ascribed to one source or origin, the cause is the same, although we have not yet had the opportunity of verifying it by ocular inspection as in the district between Kizil and Kok-Rabât

We may perhaps take Mirza Haidar to be detailing only the natural river systems, each under the name of its principal branch, and neglecting the artificial and perhaps more modern subdivisions of the water Even then, in an author usually so careful and accurate, it would be difficult to account for the omission of any representation of the Yamân-yâr or Telbachuk system from his list, unless it be that they are derived from the parent trunk of the Tuman.

South of the Shahnâz there is no other important stream till we get to the Yârkand River.

Having thus traced up most of the water which flows through the country between Kâshghar and Yârkand into four or five main trunks, radiating in deltas or fans, we have to discover whence these come There seems little doubt that the *Kâshghar River* derives its chief supply from the combined Terek and Alai streams mentioned above It is doubtful whether the Yamân-yâr system has an independent trunk stream distinct from that of the Tuman or Kâshghar River. The Chinese author quoted by Colonel Yule assigns to a river of that name a very important part After various adventures in the mountains, it is said to enter the Kâshghar frontier, and form not only the River Tailibuchuk (Telbachuk), but several others, that is, it is made to be the parent of what I cannot help considering as at least two distinct and unrelated river-systems, or at any rate of parts of them

The origin of the most southerly of the river-systems detailed above, that of the *Shahnâz*, seems pretty safely assigned to the great valley or opening in the mountains almost due south of Yangi-Hissâr By this gorge the Pâmir may be gained, and thence Wakhan and Badakhshân.

There remain then the intermediate system or systems, the *Kusun* and the *Tazghun*, whose origin we require to ascertain

Now I have convinced myself since arriving in Kashgharia (as far as one can do so without visiting the spot), that there is a distinct opening in the mountains between the two culminating snow peaks to the west and south-west of Yangi-Hissâr, which probably approach 20,000 feet in height The more northerly of these two peaks may be called the *Tash-balik* (Kirghiz dialect, *Tashmulak*), from the township of that name near its base The second is known as the *Tagharma* (Kirgh , *Taghalma*), on the one side, and as the *Ui-tagh* (house-mountain), from its shape, on the other. It is not often that one gets the opportunity in this hazy climate of distinguishing more than the mere outline against the sky of a line of mountains some 60 miles off It requires a very clear day to show the details against the face of the mountains Two or three such opportunities I have lately enjoyed from Kâshghar, however, and the impression which I, as well as others of our party, have received, is that, what in outline appears a mere depression or "col" in the ridge between the two above-mentioned peaks, is in reality an opening through it. In this opening, which leads apparently far in between the mountains, we have a probable origin for one at least of the river-systems whose sources we are looking for

A Kirghiz acquainted with these mountains informed me the other day that the *Kara-kul* (the smaller of the two lakes of that name, of course) lay directly behind them, on a large elevated plain No water, he says, actually leaves the lake, but if any were to do so (owing to the raising of the surface), it would flow out past the Ui-tagh (Taghalma) into the Tashbalik River. This approximate position, and the eastern outflow of the smaller Kara-kul, agrees with the account given to Colonel Gordon's party My Kirghiz informant was not able to say which of the rivers of the plain was formed by the Tashbalik stream

The mountain belt visible on the west of Kashgharia thus seems to be broken through by several streams flowing with a general west to east direction from the high plateau behind it. We have first the Oksaldi opening (from the Alai), perhaps another at Bori-Tokai, then the Tashbalik opening, then that of the Shahnâz, south of Yangi-Hissâr These seem to be divided from one another by a series of gigantic ridges, whose eastern extremities and spurs, coalescing together to the view from the effect of perspective, give an appearance of continuity to the mass This is a very common experience in mountain exploration, and several times it has happened to me to walk through what, to all appearance, was a serried mountain range barring my path, and to find it really consists of several ridges running at right angles to the apparent axis of the mass, whose seeming continuity was a mere optical illusion I think we should consider the mountains on the east of the Pâmir plateau, not as a range lying roughly north and south, and cut through by the rivers (as is the case with the continuation of the Mustak Range south of Karakoram), but rather as a series of more or less parallel ridges whose direction is roughly east and west, and between which the eastward drainage of the Pâmir plateau escapes It is probable that we could trace some of these ridges right out and even across the table-land at their back, where their axes would form a separation between the several Pâmirs This would be in harmony not only with the lie of the ridges bounding the Alai (seen by Fedschenko), but also with those traced by Colonel Gordon's party on the north of Kâshghar, where the southward flow of the streams does not prevent the ridges from running east and west, or, as Dr Stoliczka expressed it, "the system of drainage has no essential effect upon the direction of the hill-ranges. This, dating from much older times, was mainly an east-westerly one, following the strike of the rocks which compose the whole mountain system."

A somewhat corresponding account is given by Colonel Gordon's party of the Southern Pâmir region, adjoining the district in question. Captain Biddulph writes "The Pâmir, instead of being a steppe which you can march across in every direction, consists, as far as we can make out, of a series of broad valleys at a great elevation, called by the names of the different Pâmir, along which the different roads run" (between Eastern and Western Turkistan and Badakhshân) "The whole way from Aktash to Sarhad, four days' march, we were in one broad valley, there being no perceptible rise between the lake (Pâmir Kul) and the commencement of the waters flowing west" The forthcoming report by Captain Trotter, R E, on the exploration of the Southern Pâmir, may be expected to clear away all remaining difficulties on this subject

It is across this Pâmir region that Mirza Haidar's next gauge-line leads, viz, that from Yârkand to Badakhshân *Balor* is here mentioned, in passing, as being conterminous with the Yârkand provinces of Raskam and Taghdumbash in the region which succeeds Pâmir, as one follows round the mountain-curve After Balor comes Tibet, according to our author. Now, the farthest province of Tibet in this direction, as described by him, is *Balti*

In another passage he tells us "The Eastern border of *Baloristân* adjoins the country of Kâshghar and Yârkand" (viz, the provinces of Taghdumbash and Raskam above mentioned), "its Northern border adjoins Badakhshân, its Western, Kâbul and Lumghan (Lughman), and its Southern border is the country of Kashmir"

Balor, therefore, included the present districts of Kâfiristân, Chitrâl, Yas-în, Gilgit, Hunza-Nagar, &c. Probably, it also extended south of the Indus to Astor and Chilâs. Wakhân is excluded, being considered part of Badakhshân

According to Mirza Haidar's definition, therefore (and he was in a good position to judge, having conquered the country), Balor answered to Dardistân Colonel Yule has already shown, from a comparison of authorities, that this is where we must look for it

We now come to the route from Yârkand to Kashmir We know that he traversed in person the Karakoram Route, though whether by precisely the same line as is now in use seems uncertain. And here I must mention a feature which I noticed in my last journey, having missed it before.

The valley by which one approaches the Karakoram Pass from the south side is a broad open one, bordered by comparatively low ridges on either hand, arranged as it were *en échelons* After ascending very gradually for some 12 miles from Daulat-Beg Uldi (the last camp), rising only some 800 feet in that distance, the road leaves the valley and turns up the hill-side on the right, and after a short ascent (of some 700 feet) crosses a low neck into some other equally-gently sloping open valleys leading north. This is the Karakoram

Pass. There is no snow near it, and the neighbouring ridges are only 100 or 200 feet higher than it. But while resting on the southern ascent above mentioned, I noticed that the broad Daulat-Beg Valley culminates a mile or two beyond where we had left it, and rises no longer. On the contrary, after seeming to continue at the same level for a short distance, it begins to slope distinctly downwards and away from us towards some snow mountains on the north-west. Further it seems to turn northwards under these mountains (disappearing from the sight), and the caravan-men reported that it joins the Yârkand River at *Kufalung*. The following was my note, written on the spot:—"It seems certain that it cannot turn *southwards* and join the Shayok, for a careful distant scrutiny reveals no opening in the wall of mountain which forms its south-west side, and which appears to join on to the mass of snowy mountain which bears from 293° to 300° (about)."

This appearance might be deceptive, but there remains the fact that all the head-waters of the Shayok south of this, as well as of the Nubra River, come out of vast glaciers amongst gigantic mountains, and it is almost impossible to conceive that a higher source should exist, whose water would have to enter one of these glaciers at its head and flow out under it. The native report of the junction of this valley from the southern side of the Karakoram, with the Yârkand River at Kufalung, seems less liable to objection, and agrees better with other circumstances. Strangely enough, we have a report to the same effect, given by Vigne. "The Kurukurum Mountains I believe to be a branch or spur from the Muztak. . . The appellation appears to be applied to a crest at the summit, 500 feet high, *which can, however, be avoided by a circuit of a few miles*." The easiness of the ascent of the small rise constituting the pass, and the importance of avoiding any prolonged stay in this rarefied atmosphere (which forms the real difficulty of the Karakoram), accounts for the fact of the short cut over the "col" being used by caravans instead of the *détour* by the almost equally elevated valley.

But if the above conclusions be correct, it is evident that the so-called Karakoram *Range* has no *locus standi* left. It has before been shown that further *east* the water-parting, supposed to be represented by that name on the maps, is not even a ridge, but that many of the streams running into the Indus on one side, and into the Turkistân Rivers on the other, originate close together on open (though elevated) plains. But now it would seem that even directly *west* of the Karakoram Pass we may ride across on a level from sources that feed the Indus into others which join the Yârkand River. The little ridge of Karakoram, therefore, is cut off on both sides, and has no physical connection with the mighty Muztak Range and its peaks of 28,000 feet of elevation, on which it has wrongly imposed its name in European maps, though never in the minds or speech of the natives

It may perhaps be urged in reply (as it has been before) that this is a mere question of names But I venture to think that, unless it be considered that the difference between a *range* and a *plateau* is unimportant, it is best to keep its own proper name for each

[The above Paper will be published entire, with a Map, in the 'Journal,' vol xlvi]

The PRESIDENT remarked that the Paper was full of interesting geographical matter with regard to the mountainous region to the N and N W of India, and contained a great deal of new information, especially with regard to the passes between Kâshghar and Kokand This subject was particularly interesting now, because it was generally known that China was making a great effort to recover from Yakoob Beg possession of Eastern Turkistan, Russia having taken part in supplying the commissariat for the starving Chinese troops, who were waiting while the wheat was sown and grown behind the Great Wall The subject was, therefore, one of political as well as geographical importance

Lord LAWRENCE said the regions described in the Paper had always been to him a source of great wonder, for our knowledge of it had been only of a mythical nature until very recently, and even the travels of our countrymen, however meritorious and interesting by comparison with what was known before, still left our information very meagre, and it was very difficult to draw any conclusions of a satisfactory nature with regard to those countries In a military point of view he thought our Indian Empire had very little to fear from that side of Asia, owing to the wide extent of lofty mountainous country that intervened If ever the British and the Russians encountered each other in India, or the countries adjacent to India, it would be rather on the western side towards Khorassan and Meshed He, however, trusted that that day was far distant There was room enough for both nations to employ themselves in peaceful work in Asia for many generations without coming into contact, and if he were a Russian instead of an Englishman, he should strongly advise his countrymen to rest content with what they had in Central Asia, and what they might still get at a comparatively cheap cost, and not to break their heads against the British power in India

Colonel MONTGOMERIE said Mirza Haidar appeared to give a very correct account of the mountains in and around Kashgar, and his remarks as to the Pamir, and the Alai, and the route across to Khokand were exceedingly valuable even at the present day In the twelfth century Marco Polo crossed from Badakhshan over the Pamir to Kâshghar, but from that time to the days of Mirza Haidar no information was obtainable about those regions Since this latter period, with the exception of the account given by the Jesuit missionaries, nothing had been learned with respect to the district till quite recently, and it was not even known how Marco Polo made his way from Badakhshan to Kâshghar in preference to Yarkand This difficulty arose from a mistake in the earlier maps, which placed Yarkand very much further to the west than its true position From the time of the Jesuits nothing was heard of those regions till Moorcroft in 1834 sent Izzut-Ullah from Leh to Kâshghar From that time to 1861, when he first had the honour under Lord Lawrence of initiating the explorations by natives, the subject was dropped, but in

1863 they at last succeeded in fixing the position of Yarkand by means of the journey of Mahommed Amin, and in 1864 and 1865 Mr. Johnson made his way to Ilchi. From that date our knowledge of the country had increased almost as rapidly as our knowledge of Africa had done. Still, it was only the immediate neighbourhood of the lines of route that anything was known about, and we were still ignorant of what became of the great river that runs past Yarkand at a rapid rate. It might run into a great lake, or disappear in the desert of Gobi. All that was known was that it did not reach the sea. There was also a very large track away to the east about which nothing was known. He agreed with Lord Lawrence that the Himalaya system of mountains, 400 miles in breadth, and, on an average, over 15,000 feet high, presented an impenetrable barrier to a modern army. The only army that ever crossed it went from the Indian side, and according to the Raja-Tarangini it never came back again. The surveys in which he had been engaged extended only to the frontier, but the whole of the supplies of the surveying parties had to be carried on the backs of sheep, and when the food was eaten they eat the sheep. Every one in India, however, was curious to know what lies behind the snowy peaks that were seen from the plains. Since our occupation it had only been crossed in two places, by Turner and one or two others near Darjeeling, and by Johnson, Shaw, Hayward, and the late missions near Laduk. Until his agents made their way to Kinglo, literally nothing was known of what lies beyond. It was now known that there was a series of four districts running along at the back of the mountains and coming out to the north of Lassa, utterly desert, and only inhabited by a few nomads who picked up sufficient grass for their flocks. It was quite incapable of supplying any commercial traffic of value, and it was not worth the while of the Indian Government to run any great risk for anything that was to be got on that side. In the interests of geography, however, it was most desirable to have more complete knowledge of the north of those 1500 miles of mountains. There was a very large tract of country lying between India and China about which nothing was yet known. Quite recently one of his explorers extended his journey from Kinglo to a point on the Tengri Nur Lake north of Lassa, returning through Assam to Calcutta, but he did not come across any rich country which would give any hope of a profitable connection with that part of the world.

The PRESIDENT said all present must be glad to hear from such excellent authorities as Lord Lawrence and Colonel Montgomerie, each *facile princeps* in his own line, that the Indian Empire was quite safe from any approach on the side of the Himalayan barrier, which presented a width of 400 miles of mountain ranges higher than the Alps. The chief features of interest, so far as the approach to Eastern Turkistan was concerned, were the rivers, which, flowing from west to east, formed the avenues of approach from the west and from Kâshghar, the great caravan route across the desert, led into Szechuen and the other rich western provinces of China.

The President, in conclusion, announced that the Council had that day taken into consideration certain proposals that had been laid before them by General Strachey, Mr. Francis Galton, and supported by many other distinguished members, in reference to the promotion of the more scientific branches of geography. A scheme had been approved of, which provided, amongst other things, for a series of Lectures by eminent men of science on various subjects in Physical and General Geography. The resolutions had been ordered to be printed in the 'Proceedings.'

ADDITIONAL NOTICE.

(Printed by order of Council.)

Notes on the Physical Geography of Paraguay. By KEITH JOHNSTON, Esq.

PARAGUAY may be regarded as a large promontory of the great table-land of Brazil, of about the same extent as England, bordered by the two main tributaries of the Paraná, and abutting in the west and south on the vast sea-like levels of the Chaco and the Pampas, which fill the central region of South America. No part of it, as far as it is known, much exceeds 2200 feet, and none falls beneath a level of about 250 feet above the sea.

Midway in the artificial frontier which separates Paraguay from Brazil on the north, the line of which has been marked from the mouth of the River Apa, in 22°, to the great falls of the Paraná, in 24° S., a broad belt of heights passes across from the Brazilian table-land, maintains a southward direction almost continuously through Paraguay, and forms the water-parting of its interior rivers, terminating at last in a series of bluff heights on the Upper Paraná, where this river, turning westward, separates Paraguay from the Argentine province of Corrientes. This is the main line of height in the country which determines its general form and its slopes.

Taking the southward channel of the River Paraguay as indicating the lowest level of Central South America, the form and elevation of the lands to east and west of the portion of it which bounds the country, afford a strong contrast. On the Paraguayan side, especially towards the north of the Republic, the land (as shown by the barometric heights, table, p. 506) rises from its east bank steadily towards the interior, gaining an average of about 200 feet in the first 50 miles inland, and an equal amount in the second and third of such distances as the base of the central height is approached. Up to this the land swells in gentle undulations, with open, ill-defined valleys; excepting where a few isolated hills are scattered, no prominent ascent is observed. The plateau of Amambay, as the central height is named in the north, has, however, a sharply-defined edge to the westward, which is of considerable height, and in some places is almost precipitously steep. The differences of the elevations of the Laguna de la Reunion (1069 feet), and of the first camp on the plateau (1640 feet), and again of the point called the Mangrullo, above the Yerbal of Chiriguelo (1777 feet), and the Arroyo Claro, at the base of the plateau edge (618 feet), show the amount of the ascent from the river-slope to the highland.

Turning now to the western or Chaco side of the datum line given by the Paraguay River, the land in contrast to that of the eastern bank appears of a uniformly dead level, without a single rise or landmark along its horizon-line.

The view westward across the river from any height on the Paraguayan side always presents the same flat sea-like plain covered with forest, with here and there open patches of grass-land or marshy tracts, or shallow flats of water, glittering in the sun.

Looking eastward towards the valley of the Upper Paraná from the central height of Amambay, the land appears to descend much less rapidly than on the west: broad spurs from the plateau stretch away towards the river, enclosing deeper tributary valleys between them. The whole of this slope of Paraguay has a considerably greater elevation than the western one. The Alto Paraná below the great fall in 24° S. is probably at an elevation of several hundreds of feet above the corresponding point of the Paraguay River in that latitude, and its valley, unlike that of its great western tributary, being shut in between the heights of Paraguay and those of the southern provinces of Brazil, belongs to the plateau, and not to the plain The river only escapes from the deep trench which it has cut for itself, where it broadens with less rapid current in turning eastwards to pass by the levels of Southern Paraguay

The isolated heights of Eastern Paraguay deserve some attention Throughout those which we have noticed in the north between Concepcion and the plateau the same form and character is observable The circle of Cerro Corá, the Sarambi or scattered hills, and the hill called Tranquerita, are flat-topped, or gently-rounded masses of red sandstone, rising abruptly from the undulating country which surrounds them, to about 600 feet of relative elevation, fragments apparently of a formerly general elevation which has been swept away The form of the Tranquerita is specially illustrative of many of the isolated hills of Eastern Paraguay It is a long, narrow, rectangular block, extending for several miles north to south with perfectly flat, tree-covered top, and with a precipitous cliff extending quite round the upper half of its height

A more important chain of outlying heights stretches across the south-western angle of the country from the neighbourhood of the capital to near the Alto Paraná The broad plateau on which Asuncion is situated is a main feature of this series Its edge skirts or forms the left bank of the river southward from the city for 25 miles, and it extends inland for 40 miles to the village and plain of Paraguari The greater part of the capital is built immediately on the top of its red sandstone cliff edge, and some of the houses, such as the Cabildo, or old Government-house, are so close to the verge, that a step or two from their doors would lead over the precipice On an average this Asuncion plateau is about 200 feet in relative height, its surface is undulating, but the borders are marked not less distinctly to north and south than they are towards the river On the north side a number of rounded, conical hills, such as the cerros of Areguá, Ibitipané, and Pirajú, rise above its level, the south edge is also marked by several prominences, among which the Cerro de dos Cruces at Jaguaron, a mass of red sandstone with flat summit, recalls the form and character of the Tranquerita before mentioned The Cordillera of Altos rises to a somewhat greater general elevation north-eastward of the Asuncion plateau, and bending round from two prominent hills (the Cerro Costa and Cerro Sto Tomas) at Paraguari, also abuts on the River Paraguay Between it and the former heights lies the valley of the Salado, containing the Lake of Ypacarai (12 miles in length) The Cordillera of Altos slopes steeply to the Salado Valley, but on its north-east side falls in a number of spurs and deep-cut valleys to the River Pirebebuy A spur of this range also stretches out eastward from the angle which is formed by the hills of Paraguari, having a southern slope termed the Costa Pucú (long border), along which runs the main route to Villa Rica At the pass of Sapucai on this track, a chain breaks off to southward, and connects itself with several irregular masses of height, which occupy the country southward as far as the middle of the River Tebicuary, dividing some of its tributaries from those of the great lagoon of Ypoá

One of the most remarkable features within this group of heights is the plain of Paraguari, a level grass-land of about 20 miles in extent each way, almost completely shut in by wooded hills on every side, and suggesting the basin of a former lake The heights previously described close it steeply on the north and east, and on the south there rises a remarkable block of hills called the Cerros of Acaay, with lateral branches towards the villages of Ybicui and Carapegua The perfectly conical shape of many of the hills which surround this plain is remarkable. Of such the Cerro Costa, Cerro Ybitimi, Tatuqua (the "burrow of the armadillo"), and the tops of the knot of Acaay are good examples, but two hills, of about 600 or 700 feet in relative height, named the Yangua-á and Yangua-mi, which rise isolated like sugar-loaves from the middle of the plain, have this form in greatest perfection.

Nearer the Tebicuary Plain the numberless hill-tops of the department of Caapucu form an almost independent mass, as do also the smaller hills of Quiquio.

Beyond the Tebicuary, in the Missiones, a well-defined plateau, of which the conical Cerro of Sta Maria, and the chain of Sta Rosa, are the summits, stretches out from near that river to the border of the Paraná at San Cosmé.

The line of eastern height just described, from Asuncion to the Paraná, shuts off a large south-western angle of level marshland, averaging 50 miles in width, the lowest portion of the country, distinct in character from any other part of the land, and recalling rather the features of the Chaco side of the Paraguay River. The heights descend abruptly into those marshy levels, and the view towards the Paraná, over the Esteros, is rarely broken by the smallest rising ground. Dense growths of reeds 6 or 8 feet high, or shorter grass (*Capu pytá*), or water-plants, appearing in broad, shallow flats of water, are the general covering of the Estero region, but here and there a belt of wood may be seen following the line of firmer ground.

Excepting in the marsh-region of the south-west, and immediately along the borders of the rivers, the soil of Paraguay is dry, porous, and sandy. Where the surface is too closely covered with vegetation to enable its character to be easily observed, the ant-hills (generally 2 or 3 feet in height, sometimes attaining 8 feet), which are dotted about in every landscape in great numbers, are sure indicators of the composition of the soil. They are almost invariably hard and bare hillocks of red sand, sometimes weathered into castellated or chimney-like shapes. But on the borders of the marshes, where they are necessarily built of black alluvial soil, containing a great quantity of vegetable matter, they are soft and crumbling, and at once become covered over with vegetation growing out of them.

Forests.—Lying between the moist tropical climate of the Brazilian "selvas" and the dry region of the vast grass-plains of the Argentine Republic, Paraguay shares the character of each, and enjoys an almost equal amount of forest and pasture-land. Its larger and more continuous forests occupy the eastern watershed of the country, or the slope to the upper Paraná, a region which is so difficult to penetrate on this account, that it has been left, up to the present time, in undisturbed possession of its original Indian peoples. Though numerous tracks lead north and south through the length of the western half of the country, there is not even the smallest wood-path across from east to west in any part, all communication from the more populous western side ceasing before the central heights are reached. In surveying the frontier line, the Limits Commission spent six months in cutting a pathway—long since overgrown again—through the forests of the north-eastern border, to reach the eastern limit on the Paraná.

In the western shed of the country, on the other hand, grass-land, rather than forest, prevails, but everywhere patches of forest, of greater or less extent, are comprised in the landscape. The hills and heights are almost invariably covered to their summits with wood, and belts follow the river courses. Where wood occurs out in the open country, it always takes the form of the compact mass termed an "Isla de Monte," rounded in outline, and very sharply defined from the grass-land—a circumstance which is probably due in the main to the frequent burning of the pastures, when the camp fires spreading out in lines of many miles in length burn all before them up to the edges and round the "islas," the damp close underwood of which they can never penetrate. These masses of forest comprise that infinite variety of splendid timber-woods for which Paraguay has become famous. Here and there the magnificent "lapacho," the oak of Paraguayan woods, is recognised by the pink flowers which cover it completely during some months of the year Some of the rising grounds of the Missiones plateau have a different character, being dotted over with thorny bush, and having dwarf "Yatai" palms, the highest of which scarcely surpass 3 feet, scattered through the long grass. These little palms are said to occur in great numbers also in the Argentine province of Corrientes, but are not noticed north of the Missiones About lat 26°, the taller palm, called the *Coco* in Paraguay, with feathery head and bunches of grape-like fruit, begins to be common, and this is the palm which is seen most frequently in the neighbourhood of Asuncion The much more valuable "Caranday" (*Copernicia*), commonly known as the "black" palm, from the colour of its wood, with broad fan-shaped leaf-head, and fine perpendicular stem rising to 40 or 50 feet, does not appear in numbers till after passing some distance north of Asuncion. Great forests of this palm are seen, however, to northward of the 25th parallel, both on the Chaco and Paraguayan sides Through the operation of some natural law they are planted at regular distances apart, and totally prevent the growth of underwood, so that the whole space in which such a forest appears is perfectly clear of aught else than these upright pillar-stems, and the short, clean grass beneath them The Caranday palm-forests cease on the western slope of Paraguay, inward from Concepcion (23° N), at an altitude of about 700 or 800 feet Large quantities of this palm, which from its durable qualities (in contrast to the "white" wood of the other palms, which quickly rot) is in great demand for roofing-purposes throughout the Plata, are cut and sent down the Paraguay

The *Pindo*, a palm closely resembling the *Coco* in its feathery head and general appearance, though of somewhat larger growth and darker leaf-colour, is frequently seen scattered among the forests of the centre and north of Paraguay, but does not occur in congregated numbers like the Caranday

A dwarf variety of the Caranday, a slender, graceful little palm miniaturing its larger sort, scarcely two feet in general height, was frequently seen in ascending to the plateau in the higher slopes, but ceased before the highest levels were attained The "Yatai-guasú," or large variety of the palm of the Missiones, growing to about 15 feet in height, with a remarkably thick stem, was observed soon after passing inland from Concepcion Captain Page notes that this palm ('La Plata,' p 166) is not seen on the banks of the Paraguay south of the Pan de Azucar, a hill near the river, some distance north of the Paraguayan frontier

The Yerba-maté (*Ilex paraguayensis*), the tea-tree, upon which alone the feeble existence of the Republic now depends, has been frequently described. In size and form this evergreen resembles the orange, but is more delicate in structure The leaf is oval, less glossy, and more elongated than that of the orange, and may be recognised by its serrated edges The yerba-tree is scattered all through the forests of Central and Eastern Paraguay, and is nowhere an object of cultivation In Northern Paraguay it appears to confine itself to the higher grounds, one of the most noted yerbales, that of Chiriguelo, is on the steep slope of the plateau, at an elevation of perhaps 1000 feet above the sea. In the somewhat cooler climate of Southern Paraguay the tree descends to lower levels, as it does in the southern provinces of Brazil, and is more accessible, though the quality of its products appears to diminish in like proportion

Rivers—The great enclosing rivers of the country, the Upper Paraná and its tributary, the Paraguay, differ very much in character, besides that the former is estimated to have six times the volume of the latter at their confluence The Paraná, as we have previously noticed, belongs for the greater part of the distance, in which it forms the limit of the Republic, to the wide eastern table-land of South America Touching the Paraguayan frontier first where it tumbles over its great fall, the "Sete Quedas," in 24° S, it afterwards rushes southward between deeply-cut enclosing walls with a rapid eddying stream which only slackens its pace gradually as the river begins to turn westward on leaving the plateau Along the south of Paraguay it is a magnificent river, varying in width from 1½ to perhaps 3 miles, still moving with a swiftly-flowing current, but presenting no direct obstacle to navigation, excepting in the cataracts which it forms on each side of the long islands of Jacireta and Apipé, enclosed by its branches in the middle of its great westward bend

The Paraguay, on the other hand, is the great artery of the vast central plain of the continent, which, keeping the perfect level of the Chaco throughout on its right bank, winds along the base of the promontory of the Brazilian plateau which forms the Republic on its left side With more frequent curves than the Paraná, its current is gentler and more uniform, and its value as a great highway of the continent infinitely greater

Both have a pretty regular rise and fall throughout the year, varied by minor irregularities of rising and sinking The Paraná, the upper basin of which in Brazil receives the rains of the Atlantic coast-land, which set in there in October, begins to rise on the borders of Paraguay in December or January, swelling up to an average height of 12 feet above its lowest level in March, and descending irregularly towards its low stage during the rest of the year The Paraguay, drawing off the floods caused by the rains falling from January till April in its broad shallow basin on the inner borders of Brazil and Bolivia, begins its swelling at Asuncion in February, and continues a gradual rising till June or July, after which it sinks again about 15 feet to its low February level The two rivers are thus in opposition in their flooding during the greater part of the year at their confluence, the Parana being full in February and March, while the Paraguay is lowest, and the Paraguay being highest in July and August, when the Paraná is sinking to its deepest ebb The affluents of both rivers from within the Republic partake of the character of the main stream to which they contribute, thus not one of the rivers flowing east to the Upper Parana from the central heights of Paraguay is known to be navigable, and all form falls or cataracts in tumbling into its great trench The rivers of the western slope, on the contrary (excepting the two most northerly, the Apa and Aquidaban), are all navigable for long distances upwards from their mouths in the Paraguay, the Ypane, Jejuy, and the largest interior river, the Tebicuary, especially, affording useful highways to the interior The hydrography of the marsh-region of the south-west angle of Paraguay presents some remarkable features Midway between the southern edge of the Asuncion plateau and the lower course of the Tebicuary lies the great lagoon of Ypoá, 20 miles long and on an average 10 miles wide, this is a great patch of perfectly fresh water resting on a bed of clean sand, though surrounded on three sides by great reedy marshes, and so shallow is it, that the winds prevailing from north to south drive its waters for some distance before them when they encroach on one shore and leave the opposite one dry The chief feeder is the River Canabe, which gathers its supplies in the basin-like plain of Paraguari Since there is no apparent fall from the plain of Paraguari to the Ypoá levels, and since the Canabé is slow and ditch-like, it is probable that the lagoon is at least 100 feet above the level of the River Paraguay opposite to it No less than four outlets or marsh-drains are said to connect the Ypoá with the Paraguay westward, and another flows from it to the Tebicuary The last, the only one which we have actually seen, is a large stream quite equal in apparent volume to the Canabé, and joins the Tebicuary with a good current The southern "esteros," of which that called "Neembucu," "the endless," is the largest, are none of them stagnant, but drain to the Paraguay and Paraná by more or less definite outlets.

The sharply-marked edge, which the plateau of the Missiones presents in descending into the level of the marshes, suggests that the Paraná has at one time had its course along its base, and that the levels which extend from these heights to the present channel have been worn down by a gradual sideward movement of the river, indeed, one of the most interesting features of the great rivers of this region is the apparent confirmation they give of Von Baer's disputed law of the mutations of river-channels "Running water," he says,* "moving from the Equator towards the Pole, carries with it a greater velocity of rotation than that of higher latitudes, and in consequence presses towards the eastern bank," and, conversely, "water moving from the Pole towards the Equator approaches it with a lesser velocity of rotation, and therefore presses towards the west" "In the northern hemisphere, however, for rivers flowing northward the eastern is the right bank, and for those flowing south the western bank is also the *right*, so that this is the one which being attacked becomes steeper and higher, while the left is low and subject to flooding Should the foregoing explanation prove to be the true one, it follows that in the southern hemisphere the *left* bank should be the higher, the right the lower and flooded one"

If, as some authorities maintain, the operation of this law which clearly evidences itself in the deflection of the winds, is overcome and rendered of no effect in the case of rivers through the restraint imposed on them by clinging close to the earth's surface, the number of examples in which the observed form of meridional river channels agrees with what would result from the working of such a law cannot be regarded as other than most remarkable coincidences The Volga, with its steep right bank and uniformly flat left shore, from the confluence of the Oka downwards, the Don, Dnieper, Dwina, Mesen, Petchora, Obi, and Indus in the old world—the Mackenzie and the Mississippi, with its frequent "bluffs" on the right and "bottoms" on the left bank in the new, with many others—have been cited as examples, giving proof of sideward movements to the right in the northern hemisphere

In his voyages up and down the Nile, Dr Schweinfurth has had frequent opportunity of observing the character of that great meridional river, and gives ample proof of its eastward inclination, citing many towns, which, originally founded as river ports, have been left to decay at considerable distances inward from its western bank, their traffic having passed over to other places of more recent growth and more convenient site †

Returning to the Paraguay and the Paraná, the evidence of sideward movement to the left which they present, whether from the operation of this law of deflection or from some other cause, is very striking An explanation of the eastward tendency might perhaps be found in the rule which Dr Peschel has shown to be of frequent application,‡ that the mountains which have been elevated more recently, or the younger heights, press the courses of rivers towards the base of the older hills It is generally admitted that the Andes have been rising century after century, and with them, but at a slower rate, the pampas and plains of South America have emerged from the sea, through an upheaving force which dies away towards the Atlantic, or which may cease at the base of the older heights of the Brazilian plateau. From opposite the northern border of Paraguay in 22° s to 33° s., or for nearly 800 miles, the Paraná and its great tributary have an almost truly meridional direction, on their right banks throughout this great distance, with the exception of two little isolated conical hills on the Chaco bank, a short way above Asuncion, of less than 300 feet in height, there is not the smallest break or rise in the uniform sea-like level of the country which stretches away to the western horizon On the left bank of the Paraguay, as previously noticed, the country begins to rise at once towards the central heights, or the river skirts the smaller outlying plateaus, and this side almost invariably presents a strong contrast by its height to the levels of the right bank. Humaitá, Pilar, Villeta, Asuncion and Concepcion, some of the largest places in the Republic, are built immediately on the high eastern bank, but the only permanent settlement on the opposite shore for many hundreds of miles is the low-lying and fever-stricken military post of the Villa Occidental

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* 'Kaspische Studien,' viii (1860)

† "Der Nil u. das Baer'sche Gesetz der Uferbildung"—*Petermann's Mittheilungen*, 1865

‡ 'Vergleichenden Erdkunde,' 1875, p 145.

From the confluence of the Paraguay and Paraná for nearly 400 miles, or from above the town of Corrientes to near Rosario, the left bank of the Paraná is formed by a continuous "barranca" of levelly stratified clay-beds, of from 60 to 160 feet in perpendicular height The strength and depth of the current whirl and rush along the base of this cliff, eating into its foundations. On the opposite or right bank the river is broken into innumerable "riachos" or shallow, changing branches which wind with sluggish current round the low marshy willow-covered islands which separate them. Looking westward from the height of the barranca at the towns of Corrientes, Bella Vista La Paz, or Paraná, the same uniform level of the Chaco presents itself without the smallest rise or point to break the line of the horizon, up to which extends a maze of riachos, lagoons, and inundated flats It is only at Rosario, where the river turns sharply to the east, that there is any definitely marked bank on the western or Chaco side Frequently during the rising of the Paraná in January and February, we had ocular demonstration of the gradual wearing away of the left bank, as some undermined mass would plunge down into the current, carrying with it a piece of the grass turf of the level top of the cliff, during the night the dull roar of masses of the barranca sliding into the stream might be heard from great distances up or down the river So great are the changes which are constantly in progress in the channel of the Paraná, that the river pilots assert that its sandbanks shift at every voyage Keeping Page's Sketch Survey of 1855 in hand while descending, it was evident that very extensive alterations had taken place in the twenty years which have since elapsed, so that many points of the river are now quite unrecognisable from this chart Among the larger variations since his survey, which also indicate movement towards the left, may be noted the increased width and depth of a channel below the town of Paraná, called the Riacho Paracan During Page's survey it was noticed that the depth of the then main channel was becoming less, and that a new and deeper channel had broken through a flat which separated the mainland from the island of Paracan This channel to the left is now of great width, and is apparently the main stream of the river A more striking change is presented by a reach between 29° 10′ and 29° 20′, not far from Goya, where the river at the time of Page's survey made a curious backward curve, the only one in its remarkably direct course, doubling northward for about 5 miles. This "Vuelta del Norte," as it was called, appears to be now quite abandoned, at all events as the main channel of the Paraná In watching for it while descending by canoe, we were surprised to find that the current has now taken a more direct passage to the left of the "Vuelta," having widened out a riacho, which, at the time of Page's visit, does not seem to have been of sufficient importance to merit survey

Climate—Like other parts of the globe which are situated on the borders of the tropics, and thus lie in a belt of transition between zones of well-marked seasons and climates, the meteorology of Paraguay seems to be chiefly remarkable in the irregularity of occurrence of the various phenomena Excepting a tolerably gradual and very considerable average variation of temperature from the colder to the warmer months, there are no marked seasonal changes. the temperature from one day to another may vary very considerably according to the direction of the winds, the winds are subject to the most rapid changes from one quarter to the opposite one, and the rainfall is neither more abundant in the hotter season, as in lands more completely within the tropics, nor greater in winter, as in the countries farther south.

The results of the observations by Mr Congreve, which accompany these notes, give for the first time, it is believed, a nearly complete record of the meteorology of the capital of Paraguay for one year

The most trustworthy observations of the meteorology of Asuncion, previously obtained, were those made on board the steamer *Waterwitch*, during the United States Expedition of 1853-56, by Captain Page, when engaged in the survey of the rivers; but from the nature of this voyage, short stays only could be made at any fixed point, and the records at Asuncion are complete only for four months The averages for these months have been computed from Captain Page's register, as follows —

Months	Barometer	Thermometer			Prevailing Winds
		Max	Min	Mean	
October, 1853	29 68	96°	58°	76°	S and E N E
January, 1854	29 61	95	60	80 3	S and N E
May, ,,	29·75	91	46	71 4	N E and S E.
June, ,,	29 81	90	53	70 6	N E and S E

M Martin de Moussy in his great work on the Argentine Republic, indeed gives a summary of the temperature and barometric pressure at Asuncion, in his climatic table (vol i p 348), but this is confessedly only an approximation, not based on any continuous observation

Since Asuncion is centrally placed in Paraguay, the observations taken there should give a tolerably fair representation of the general climate of the country The mean barometric readings for the months indicate very distinctly in their gradual rise to the average maximum in the coldest month (July), and their fall to the minimum in the hottest month (Jan), the close connection between pressure and temperature The same change is observed in the frequent shiftings of the wind to the prevailing directions of north and south, the barometer invariably rising before the cooler south wind and falling to that from the north The thermometer columns of Mr Congreve's Table give an average of 72° Fahr. as the mean annual temperature of Asuncion, an average comparable almost exactly with those of Benguela, in West Africa, of Bona, in Algeria, St Augustin, in Florida, or Sta Cruz, in the Canaries Between the average of the hottest month, January (84° 6), and of the coldest, July (58° 1), there is a mean seasonal change of temperature of 26° 5, but morning temperatures of 46° to 48° are not uncommon in Asuncion in July, and at midday during the hot months the thermometer not infrequently rises two or three degrees above 100° in the shade. The occurrence of white frosts for a few hours of the night in winter over the southern half of Paraguay, shows that the surface temperature of the ground may occasionally for a short time fall to the freezing point

Scattered observations of temperature which have been made in the interior of the country seem to show, by their being still lower—in comparison with those made simultaneously in the capital—than the increased elevation would warrant, that the temperature of Asuncion, and with it of the banks of the Paraguay, may be abnormally high Should this ultimately prove to be the case, the cause is perhaps to be looked for in the heat-conserving power of the great river bringing its volumes of warm water direct from within the tropics, and in greatest quantity during the cooler season of the year.

During 1874 observations for temperature and rainfall were being carried on in Asuncion quite independently of those by Mr Congreve, by Dr. A. Perini, the results of which were published for 1874 and part of 1875, in the 'Reforma' of Asuncion, in January of the present year. Converting the metric scales in which these observations were made to our own standard, the results are as exhibited in the following Table

MONTHS	Thermometer			Rainfall in Inches	Number of Storms	Prevailing Winds.
	Max	Min	Mean			
1874						
January	101°	67°	83°·5	3·34	2	N N E
February	100	64	83	3·93	3	S W
March	97	65	82·	3·81	2	N W
April	95	60	74	2·87	4	N N W
May	84	51	67	4·88	2	S
June	82	47	66·	6·81	1	S S E
July	86	51	70·	3·15	2	E
August	92	56	74	6·93	4	S E
September	98	59	78	7·99	6	S
October	102	61	82·5	4·88	3	S S W
November	102	68	82	3·90	1	N N E
December	100	64	81	5·59	2	N W
Mean	96	59	72	Total 58·08	32	
1875						
January	100°	67°	76°·7	2·0	3	N N W
February	103	58	83	3·9	4	N N E
March	95	66	81	3·5	2	S S,W
April	90	56	73·	11·0	4	S S W.
May	84	48	69	8·3	5	S S E
June	76	42	54	7·0	1	S
Mean of 6 Months	91	56	72·5	Total 36	19	

As far as temperature is concerned, these results agree very satisfactorily with Mr Congreve's Table, but when the columns indicating the amount of rainfall are compared, they present discrepancies for which it is not easy to account, although the whole amount for the year recorded in each case is not very unequal To obviate loss from evaporation, Mr Congreve's gauge (of the pattern recommended in the Royal Geographical Society's 'Hints to Travellers') was emptied frequently, and there is no reason to doubt the accuracy of the record of 18 inches of rain in December, although Dr Perini has not set down more than 6 inches for that month in his table

The winds of the valley of the Paraguay incline very much to take the form and direction of the great natural trough of the river Thus there is a prevalence of northerly or southerly breezes, winds from due east or west being almost unknown, neither of these directions appears to obtain any definite mastery in any month or season, but they interchange continually The general north and north-easterly winds probably form part of the great returning sweep of the south-easterly trade-winds of the Atlantic, which have become warmed in their passage over the tropical maritime region of Brazil In the south winds, especially in the strong cold gusts of south-west wind which blow over the Pampas and take a southerly direction before reaching Paraguay, a branch of the great westerly current of the temperate zone, chilled and dried by its passage over the snowy ridges of the Andes, may, perhaps, be recognised. On an average the difference of temperature between the south and north winds in Paraguay reaches to nearly 10°, but in the case of sudden southerly or northerly storms this difference is greatly exceeded The south wind is dry, cool, fresh, and invigorating, banishing mosquitoes for a time, a north wind, on the contrary, brings a hot, moist, relaxing atmosphere, and is the signal for the renewal of action of every one of the myriad sorts of insects which join then with the frogs in filling the evening and night air with sound

From an analysis of Mr Congreve's register of the weather from January to September, 1874, it appears that out of a total of 72 days on which rain fell during that period, there were 19 days on which the rain occurred with a north or north-east wind, and 15 with that from south or south-east, but that on by far the larger proportion of rainy days, 31 out of the whole number, the wind was variable, and shifted round from one or other of these opposing directions Thunder and lightning very frequently accompany the more violent changes of the wind, vivid flashes and cannon-like claps of thunder following in quick succession more frequently still the glare of distant lightning is seen at some point on the horizon Over the Chaco, especially, dark level banks of cloud lit up now and then by sheet lightning are often seen when the weather in Asuncion is still fine, though this appearance may be regarded as an indication of a change about to take place. Paraguay is free from such excessively violent cyclonic storms as those to which regions in corresponding latitudes of South Africa, coming within the limits of the hurricane-region of the Indian Ocean, are liable, but very powerful wind-storms are by no means rare. Such are the occasional sudden blasts of south wind which generally precede a period of steady breezes from that quarter, and which it cannot be doubted are of the same character and origin as the "Pampeios" which sweep over the Argentine plains, or are probably a continuation of the more extended of these storms

The approach of these cold blasts is always marked by the appearance of a low, dark arch of condensing cloud in the southern horizon, rapidly spreading upwards towards the zenith One of these occurred on the 12th of March, while we were going up the Paraguay River, a little below Asuncion The blackness spread up over the sky in wildly whirling clouds, a gust of chilly wind struck the river below us, lashing it up into waves and spindrift, raising great clouds of sand from a bank on the Paraguayan side, and bending over the palms and other trees of the banks Quick flashes of forked lightning shot here and there, and the river assumed a strange dark olive-green colour, on which the white waves curled Striking the barranca, the waves undermined and hurled down great masses of the banks with a roaring sound, which added to the din of the incessant thunder-claps In the next reach a blast caught the steamer, and whirling her round broadside, drove her hard-and-fast on the bank

The cause of these "Pampero" winds is probably to be found not so much in an *ascending* current of air over any locally heated region of South America, as in a general rarefaction of the stratum of air lying immediately upon the great plain of the Pampas and the Chaco This heated stratum in turn raising the superincumbent air, may leave a partial vacuum, into which the heavier, colder air of the great south-westerly current presses to fill it up. If an ascending current were produced, the surrounding air would move inwards, spirally, from all sides, and a cyclonic storm might be the result It may be remarked that it is quite in accordance with the law of deflection of the winds in the southern hemisphere that the storms of Paraguay coming up from the south may have had a westerly or south-westerly direction at the place of their origin

A storm which was experienced on the Cordillera in Northern Paraguay appeared to be of a different class On the 12th of September, after a week of broken weather, a furious tempest of wind, thunder, lightning, and hail set in suddenly from the *north-east*, the first gust of which threw down the tents and demolished the stone boundary-columns which the Brazilian workmen were building After about half an hour a lull occurred, and for another short time there was a comparative calm, though lightning continued to flash incessantly As night closed in the storm set in again with equal violence, but now from the *south-west*. It is likely that this was a circular storm, moving, perhaps, to the south-east, that the north-easterly curve of its spiral path had been first encountered, and afterwards the opposite arc The effects of this storm were severely felt at the little Brazilian military outpost called the "Colonia Dourados," where it wrecked the greater part of the huts, and carried off completely the roof of the more substantially-built log-house of the Commandante Dr Perini's Table shows that the storms of Paraguay are most frequent about the periods of the equinoxes

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Report on the Hypsometrical Observations in Paraguay, of KEITH JOHNSTON, Esq, *and* Lieut C R. CONGREVE, R.N By R. STRACHAN, Esq., Meteorological Office.

The manuscripts placed in my hands containing observations made in Paraguay (and which are herewith returned) comprise

(1) A Meteorological Register kept at Asuncion, by Lieut C R Congreve, R N, during the year 1874,

(2) A few observations made with Boiling-point Thermometers in 1874, by Mr Keith Johnston, and

(3) Barometric and Thermometric Observations made in 1874, by Mr. Keith Johnston, on his journey

So little is known of the meteorology of Paraguay that even one year's register is of considerable value I have, therefore, deemed it right to work up the observations so as to make the results available for geographers and meteorologists

I have compared the simultaneous indications of Captain George's portable barometer with the hypsometers, and the results appear to me to prove that the instruments were practically correct Mr Johnston left one of the portable barometers at Asuncion, where it did good service in furnishing observations for the base station as well as in checking those made with the instrument previously in use The other one he appears to have used very successfully on his journey

As arranged by Mr Johnston with Mr. Congreve, the hours of observation at Asuncion were 9 A M and 9 P M Mr Johnston himself also adhered to these hours, so that the observations for elevations were simultaneous in all cases.

Appended are the results of the observations made at Asuncion, and a tabulated statement of the corrected data with the elevations deduced therefrom, both in a form suitable for publication

The details of the calculations are fully given on nine pages of manuscript.

RESULTS of METEOROLOGICAL OBSERVATIONS at ASUNCION, latitude 25° 16′ 30″ S, longitude 57° 40′ 00″ W, during the Year 1874, made by LIEUT C R CONGREVE, R N, and deduced from a press-copy of the original observations furnished by KEITH JOHNSTON, Esq, by R STRACHAN, F M S

1874	Barometer		Thermometer		Rain in Inches	Fine	Over cast	Haze or Fog	Rain.	Thunder	Winds									
	A M	P M	A M	P M							N	N E	E	S E	S	S W	W	N W	Variable	Calm
Months			°	°																
January	29 514	29 504	83 5	85 8	?	20		4	7		3	1	2	6	8	3	4	1	3	
February	584	545	82 4	82 4	?	13		3	12	2	11	6	2	1			2	1	4	1
March	702	665	76 5	78 0	?	2			9	9					1				7	3
April	834	798	71 9	71 4	*2 07	21	1		8	2	9	2			10	1			6	2
May	840	835	63 7	61 9	95	15	7	2	7		13	4	2	1	8				3	
June	847	841	62 3	60 9	2 00	20	3		7	2	9	4	1	5	6	1			3	1
July	922	896	60 7	55 5	3 87	20	5		6	1	11		1		10	2			6	1
August	889	880	62 6	63 2	1 07	22			9		13	1		2	6	2		2	4	1
September †	705	704	72 3	70 3	5 20	16	‡	‡	7		12			2	9	1			6	
October	668	660	75 2	72 6	12 13															
November	614	590	77 6	79 0	9 85															
December	573	538	80 6	78 7	18 40															
Year .	29·724	29 705	72 4	71 6	55 54															

Obliterated in Register

Notes —The observations were made at 8 A M and 6 P M during January and February during the rest of the year they were made at 9 A M and 9 P M In March observations were made only on the last 11 days The barometric observations have been corrected for index error and for temperature, and have been reduced to the level of the river at Asuncion

* In April the rain was measured on 3 days only, on 22nd the gauge was stolen A new gauge was started on May 10th

† On Sept. 16th at 2 A M commenced a tremendous storm of wind and rain from S till 6 A M., then rain

‡ The weather notations were all obliterated after Sept. 23rd

RESULTS of simultaneous OBSERVATIONS made in PARAGUAY to determine ELEVATIONS above the SEA-LEVEL.

DATE 1874	At Asuncion		On the Journey (1)			Elevation in Feet above the level of the River at	
	Barometer	Thermometer	Barometer	Thermometer	Name of Place	Asuncion	Sea
	Inches	°	Inches	°			
* July 29 to Aug 7	30 031	62 1	29 958	68	Concepcion	69	390
Aug 11, 9 P M	29 796	63	29 477	79	Totora	306	627
,, 13, 9 A M	30 066	54	29 908	56	Paso Mbotu	144	465
,, 13, 9 P M	30 063	55	29 849	54	Aguero-cue	196	517
,, 14, ,,	29 944	53	29 845	57	Isla of Monte	90	411
† ,, 15 to 17	29 896	54·5	29 588	61 5	Ramo-cue	288	609
‡ ,, 17 to 18	30 093	53 5	29 652	60 5	1st camp } Termentina River	409	730
,, 18, 9 P M	30 170	58	29 702	51	2nd ,,	431	752
,, 19, ,,	29 987	59	29 622	53	Apa-mi	339	660
§ ,, 20 to 28	29 776	65 7	29 351	68 2	Confluence of Apa and Estrella	407	728
‖ ,, 30 to 31	29 852	76	29 125	75	Arroyo de Oro	710	1031
,, 31, 9 P M	29 635	75	28 877	79	Laguna de la Reunion	748	1069
Sept 1, ,,	29 545	75	28 225	78	1st camp on plateau	1319	1640
,, 2, ,,	29 657	68	28 277	71	Isla Mutou	1374	1595
,, 4, ,,	29 807	70	28 002	71	Colonia Dourados	1779	2100
¶ ,, 5 to 20	29 744	71 4	27 788	66 5	Source of Estrella	1932	2253
,, 21, 9 P M	29 543	75	27 627	71	Camp in Cordillera	1921	2242
,, 22, ,,	29 596	74	27 760	72	Punta Poná	1837	2158
** ,, 23 to 25	29 912	60 8	28 001	64 6	Potrero de Julio	1850	2171
,, 27, 9 P M	29 684	78	28 200	60	Mangrullo, above Chiriguelo Yerbal	1456	1777
,, 29, ,,	29 408	75	29 105	74	Arroyo Claro	297	618
,, 30, ,,	29 649	68	29 170	70	,, Guasú	462	783

	Oct 1, „	29 799	68	29 405	68	Arroyo Puente Cubá . . .	378	699
	,, 2, „	29 874	73	29 439	70	Arimbaru-cue .	419	740
	,, 3, „	29 754	71	29 499	70	Arroyo Negla	245	566
	,, 5, „	29 627	72	29 435	75	Totora	187	508
	,, 6, „	29 584	70	29 305	75	Naranja-ty	271	592
††	,, 8 to 14	29 546	76 1	29 496	82 4	Concepcion . .	47	368
				Boiling-point				
*	Mar 20, 9 P M	29 633	79 7	211° 66		Asuncion	N	336 288
	May 17, 5 ,	29 792	59	211 70				
	July 29, 9½ „	30 070	56	211 96	67	Concepcion	90	411
	Aug 1, 9 „	29 987	57	211 81	70			
	,, 6, 10 ,	29 953	69	211 87	71			
	,, 23, 3 „	29 854	65	210·90	75 5	Confluence of Apa and Estrella	501	822
	Sept 12 5 „	29 604	76	207 40	76	Source of Estrella .	2290	2611

The barometric observations have been corrected for index errors, for temperature, and those made at Asuncion have been reduced to the level of the river

* Means of 18 observations taken at each station
† „ 4 , „
‡ „ 2 , „
§ , 17 „ „
‖ „ 2 „ „
¶ „ 22 , „
** „ 5 „ „
†† „ 12 „ „

N Calculated from the mean results of barometer and hypsometer using data for sea-level in March, 29 95 inches, temperature 73°, and for May, 30 05, 64°

(¹) The route along which these observations were made is laid down on a map of Paraguay, published in the 'Geographical Magazine,' September, 1875

From the observations made at Asuncion, I have calculated the height of that city above the sea to be 321 feet In calculating the heights on the journey I have made Asuncion the base, as observations were very judiciously made there with this object The discrepancies between two or more determinations of heights for the same place are merely of such a kind as must be expected from the complicated nature of this method of measuring elevations

The elevations of these places above the sea-level given in the last column has been found by simply adding 321 feet to the figures in the preceding column, the 321 being the elevation of Asuncion above the sea This has been calculated from the mean height of the barometer, during the year 1874, from observations made at Asuncion at 9 A M and P M, reduced to 32°, and the level of the river, and corrected for diurnal range, which is 29 665 inches, thermometer 72°, using 30 inches for the mean pressure at the sea-level, according to Buchan's Isobaric Charts, and 70° for mean annual temperature, according to Dove's Isothermal Charts These data give 321 feet for the elevation of the river at Asuncion above the sea, the 'South American Pilot' states it to be 253 feet —See Ed 1864, p 193

R Strachan, F M S

[*Note* —The original observations and the calculations therefrom have been placed in the Library of the Royal Geographical Society]

ANNUAL GRANT BY THE COUNCIL

OF

500*l* FOR THE PROMOTION OF SPECIAL SCIENTIFIC BRANCHES OF GEOGRAPHY.

IN March last the following Memorial was received by the Council —

"*Proposals for the Consideration of the Council of the Royal Geographical Society*

"The great and continued increase of the funds of the Royal Geographical Society, which now exceed in gross amount the sum of 7000*l* a-year, suggests for consideration whether the Society should not endeavour to extend, in a more strictly scientific direction, the range of the geographical work it has hitherto so successfully prosecuted There can be little doubt that the general popularity of the Society has been principally due to the interest that is attached to adventurous explorations in unknown regions, and to the novelty of their results But it is fair to conclude, from the wide-spread and increasing cultivation of Science in all its branches, that the Fellows would gladly see greater encouragement given to the study of Geography, in its various aspects, in a more strictly scientific direction

"It is submitted for the consideration of the Council that it would be in complete conformity with the objects which the Society is designed to promote, to give an increased impetus to its action in the direction suggested The aim of the Society should be to bring together in its publications all branches of knowledge properly falling within the field of Geography, and to attract to its meetings those best able to supply such knowledge or to appreciate its value By extending the influence of the Society, as it is found practicable to do so, from the promotion of geographical discovery, in which its success has been so remarkable, to that of the study of the causes which by their combined action have made the earth what we find it, a position of utility and dignity will be acquired for the Society, which will not be second to that of any of the bodies formed to promote the progress of exact knowledge

"The following proposals are submitted to the Council for consideration in the light of the preceding remarks, as indicating measures which might lead to the furtherance of the objects in view They are thus put forward to convey in a concise form a somewhat more definite conception of what is aimed at than could otherwise be accomplished, and should be understood as intended to be no more than a basis for discussion, and in no degree to suggest any limitation to the exercise of the fullest discretion on the part of the Council in dealing with the general question :—

"I That a sum of not less than 500*l* should be devoted yearly to the promotion of the special scientific branches of Geography, to be applied in some such manner as the following —

"(*a.*) For grants to assist persons having proper qualifications in undertaking special scientific geographical investigations (as distinct from mere exploration) in any part of the world

"(*b*) For grants to aid in the compilation of useful geographical data, and preparing them for publication in the form of charts or otherwise, and in making improvements in apparatus or appliances useful for geographical instruction, or for scientific research by travellers

"(*c*) For fees to persons of recognised high attainments, for delivering lectures on Physical Geography in all its branches, as well as on other truly scientific aspects of Geography, in relation to its past history, or the influences of geographical conditions on the human race

"II That the recognition by the Society of the importance of Physical Geography should be specially testified by the foundation of a Medal—of equal value and honour with the other medals of the Society—to be given for the highest order of excellence in this branch of geographical knowledge Such a medal might be called the 'Humboldt Medal'

"III That the control of this division of the Society's operations should be entrusted to a Committee of Fellows, specially selected for their qualifications, under such general rules, and subject to such final approval by the Council, as might be deemed proper

"The form of these proposals has in some measure been suggested by the experience derived from the system of the Royal Society in dealing with the Government grant of 1000*l* yearly and the Donation Fund, and of the British Association in appropriating its funds The excellent results obtained by these means are widely appreciated, and sufficiently show that needful security can be obtained for the really useful application of grants made in the manner proposed

"Signed, R Strachey, Francis Galton, Joseph D Hooker, Charles Darwin, George Henry Richards, Rutherford Alcock, J. A Grant, J P Kay Shuttleworth, J. Gwyn Jeffreys, W Spottiswoode, Alfred R Wallace, John Ball, George Bentham, T H Huxley, Frederick John Evans, John Murray, James Fergusson, H Yule (the last three with reserve as to the conditions, and name of the Medal)

"*February*, 1876"

The Council appointed a Committee to consider these proposals, who passed the following recommendations, which were adopted by the Council on the 26th of June —

"The Committee are agreed that it is a legitimate object for this Society to extend in a more scientific direction the range of its geographical work, and to encourage, by the application of funds or otherwise, all branches of knowledge properly falling within the field of Geography

"It is recommended that a sum not exceeding 500*l* should be devoted yearly, as far as it is consistent with other objects, to the promotion of special scientific branches of Geography, and be applied in some such manner as the following —

"(*a*) For grants to assist persons, having proper qualifications, in undertaking special scientific geographical investigations (as distinct from mere exploration) in any part of the world

"(*b*) For grants to aid in the compilation of useful geographical data, and preparing them for publication, in the forms of charts or otherwise, and in making improvements in apparatus or appliances useful for geographical instruction, or for scientific research by travellers

"(*c*.) For fees to persons of recognised high attainments, for delivering lectures on Physical Geography in all its branches, as well as on other truly scientific aspects of Geography, in relation to its past history, or the influences of geographical conditions on the human race, and that not less than three of the ordinary Evening Meetings, each Session, be devoted to such lectures

"It is recommended that the recognition by the Society of the importance of Physical Geography should be specially testified by the occasional award of one of the annual Royal Medals to an eminent Physical Geographer

"It is recommended as desirable, in carrying out the above, that the Council should seek the co-operation of Fellows of the Society who have special qualifications, though they may not be at the time members of the Council"

PRIZE MEDALS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

REPORT FOR 1876,

AND

PROGRAMME FOR 1877.

SYNOPSIS OF RESULTS

OF

PAST EXAMINATIONS.

	Physical Geography	Political Geography
1869	*Examiner*, A. R. Wallace (*Special Subject Palestine*)	*Examiner*, Rev. W G Clark
Gold Medal	W Grundy (*Rossall*)	H C Richmond (*Liverpool College*)
Bronze Medal	G W Gent (*Rossall*)	J D Whidl (*Manchester Grammar School*)
Honourably Mentioned	G G Butler, M Stewart, A Wilson, G B Brown, E Thomas	E Crabb, J H Collins, M L Lewis, H B Dixon, D S Bontflower
1870	*Examiner*, A. R Wallace (*Special Subject India*)	*Examiner*, Very Rev. Dean Howson, D D
Gold Medal	G G Butler (*Liverpool College*)	G W Gent (*Rossall*)
Bronze Medal	M Stewart (*Rossall*)	J H Collins (*Liverpool College*)
Honourably Mentioned	W Hind, G Hughes, F J Beckly, F W Hunt, R F W Shaw, E C Thomas	E Crabb, William Grundy, George Hogben, J D Murray, H B Dixon
1871.	*Examiner*, Dr W B Carpenter, F R S (*Special Subject British North America*)	*Examiner*, C. H Pearson, M A
Gold Medal	D McAlister (*Liverpool Institute*)	G Hogben (*University School, Nottingham*)
Bronze Medal	W G Collingwood (*Liverpool College*)	R N Arkle (*Liverpool College*)
Honourably Mentioned	R A Lundie W N Shaw, W C Hudson, F J Beckley, T Disney, W E Evill, H R F Brown W B Ffooks	F M Sparks, J B. Heath, D S Bontflower, A Hassall
1872	*Examiner*, H W Bates, F L S (*Special Subject South America*)	*Examiner*, T. W. Hinchliff, M A
Gold Medal	S E Spring-Rice. (*Eton College*)	W G Collingwood (*Liverpool College*)
Bronze Medal	A S Butler (*Liverpool College*)	W C Graham (*Eton College.*)
Honourably Mentioned	C Penrose, E Dickson, J R White, H de V Vane	R H Sayle, W L Kingsford H E Dixon

	Physical Geography	**Political Geography**
1873	*Examiner*, Dr J. D. HOOKER, F R S (*Special Subject Eastern and Western Turkestan*)	*Examiner*, Maj-Gen. Sir H C. RAWLINSON, K.C.B
Gold Medal	W C HUDSON (*Liverpool College.*)	S E SPRING-RICE (*Eton College*)
Bronze Medal	W A FORBES (*Winchester College*)	A T NUTT (*University College School*)
Honourably Mentioned	A C Cole, R C Reade, H H Hancock, H Louis, N M Richardson, G S Pawle, G R Townsend, W S Widdicombe	A Williams, W L Kingsford, G H Sing, S H B Saunders, A Hassall
1874	*Examiner*, Prof A C RAMSAY, LL D (*Special Subject The British Isles*)	*Examiner*, Rev Canon RAWLINSON, M A
Gold Medal	L WESTON (*City of London School*)	W H TURTON (*Clifton College*)
Bronze Medal	F C MONTAGUE (*University College School*)	L JACOB (*City of London School.*)
Honourably Mentioned	H M Platnauer, W S Widdicombe, C A Spring-Rice, H A Miers, C Healey, W F Wilson, A R Forsyth	J F Heyes, S H B Saunders, R W Whiston W B Styer
1875	*Examiner*, General R STRACHEY, R E (*Special Subject China*)	*Examiner*, Sir RUTHERFORD ALCOCK, K C B.
Gold Medal	H A MIERS (*Eton College*)	S H B SAUNDERS (*Dulwich College*)
Bronze Medal	A E GARROD (*Marlborough College*)	W C GRAHAM (*Eton College*)
Honourably Mentioned	C A Spring-Rice, H Perrin, H H Hancock, W D Thomson, H M Platnauer	J Vans Agnew, W M H Milner, J F Heyes, D G Crawford, T Knox, A S Moriarty
1876	*Examiner*, Prof T RUPERT JONES, F R S. (*Special Subject The Arctic Regions*)	*Examiner*, Sir F. LEOPOLD McCLINTOCK, F R.S
Gold Medal	JNO WILKIE (*Liverpool College*)	THOMAS KNOX (*Haileybury College*)
Bronze Medal	WALTER NEW (*Dulwich College*)	W M H MILNER (*Marlborough College*)
Honourably Mentioned	J A Robinson, L P Jacks, E von Lengerke, Sir M Crofton, F S Carey	J B Johnston, H W Pigeon, J F Heyes, W J Newton A R Ropes, C W MacMaster

TABULAR SUMMARY OF AWARDS OF MEDALS ACCORDING TO SCHOOLS

Total		Gold		Bronze	
		Physical	Political	Physical	Political
2	City of London	1874			1874
1	Clifton		1874		
2	Dulwich		1875	1876	
5	Eton	1872, 1875	1873		1872, 1875
1	Haileybury		1876		
9	Liverpool College	1870, 1873, 1876	1869, 1872	1871, 1872	1870, 1871
1	Liverpool Institute	1871			
1	Manchester School				1869
2	Marlborough			1875	1876
1	Nottingham		1871		
4	Rossall	1869	1870	1869, 1870	
2	University College School			1874	1873
1	Winchester			1873	

32 in eight years—13 Schools.

Liverpool College	9	City of London	2	University College School	2	Liverpool Institute	1
Eton	5	Dulwich	2	Clifton	1	Manchester School	1
Rossall	4	Marlborough	2	Haileybury	1	Nottingham	1
		Winchester	1				

PRIZE MEDALS

OF THE

ROYAL GEOGRAPHICAL SOCIETY.

INSTITUTED, 1869.

RESULTS OF THE EXAMINATION FOR 1876

List of Schools who were invited to compete in 1876.

English Schools—St Peter's College, Radley, Abingdon, King Edward's School, Birmingham, Brighton College, Bristol Grammar School, Cathedral Grammar School, Chester, Cheltenham College, Clifton College, Dulwich College, Eton College, Haileybury College, Harrow, Hurstpierpoint, Liverpool College, Liverpool Institute, London,—Charter House, Christ's Hospital, City of London School, King's College School, St Paul's, University College School, Westminster School, Royal Naval School, New Cross,—The College, Malvern, Manchester School, Marlborough College, University School, Nottingham, Repton, Rossall, Rugby, King's School, Sherborne, Shoreham, Shrewsbury, Stonyhurst College, Blackburn, The School, Tonbridge, Uppingham School, Wellington College, Winchester College

Channel Islands School—Victoria College, Jersey.

Scotch Schools—Aberdeen Grammar School, Edinburgh Academy, Edinburgh High School, Glasgow High School, Glasgow Academy

Irish Schools—Royal Academical Institute, Belfast, Dungannon Royal School, Ennis College, Portora Royal School, Enniskillen, Foyle College, Londonderry, Rathfarnham, St. Columba's College, Rathmines School, Dublin

Twenty of the above Schools furnished competitors, according to the following list, in which is entered the number of candidates in Political and Physical Geography from each school —

	Physical.	Political.
Marlborough College	3	1
Rathmines School, Dublin	1	1
Victoria College, Jersey	2	0
Brighton College	1	2
University College School	2	0
Ennis College	1	0
University School, Nottingham	1	0
Charterhouse School	1	1
Eton College	4	2
City of London School	2	1
Clifton College	0	3
Haileybury College	1	1
Liverpool College	3	2
Dulwich College	4	0
Manchester Grammar School	2	1
Edinburgh High School	0	1
Bristol Grammar School	1	0
Cheltenham College	3	2
Rossall School	2	1
Repton School	1	1*
Total	35	20

The Examiners appointed by the Council for 1876 were Professor T. Rupert Jones, F.R.S., for Physical, and Admiral Sir F. Leopold McClintock, F.R.S., for Political Geography. The examinations were held at the various schools, on the 20th of March, and the Prizes were presented at the Anniversary Meeting of the Society.

The special subject for the year 1876 was—

THE ARCTIC REGIONS (INCLUDING ICELAND AND THE WHOLE OF GREENLAND).

PHYSICAL GEOGRAPHY.

No. 1 Examination Paper, 1876.

General.

[*Candidates are not to answer more than* **Twelve** *Questions in this Paper.*]

(1) Mention the chief cities and ports, and describe the main features of the regions, passed through on the "Overland" routes, (1) *viâ* Marseilles, and (2) *viâ* Brindisi, from London to Bombay. Give the distances from point to point mentioned in the lines of route, and the altitudes of the lands traversed. Use both English and French measures.

(2) Illustrate by diagram the form, relative position, and comparative magnitude of Europe, Asia, and Africa, indicating the chief adjacent Islands,

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* This candidate was withdrawn.

Mountain-ranges, Deserts, and great River-systems. Draw a sectional diagram of the surface from the North Cape to Ceylon, showing the relative heights above the sea-level

(3) Name the principal Rivers of North America Where do they rise? Into what seas do they enter? Describe their largest Lakes, Cataracts, and Deltas

(4). Draw an outline of New Zealand, indicate its geographical divisions, briefly describe their physical characters and natural products, and mention any effects of human interference on the fauna and flora

(5) Name the chief Mountains and Hill-ranges in the British Isles on a diagram showing their relative position, and state what you know of their relative climate, productions, and geological structure

(6) Draw a plan of the Pacific Ocean, with the most important of its Islands, the chief Volcanoes in and around it, the limits of the Coral-zone, and the tracks of the best known of its Currents

(7). Define what is meant by the Terrestrial Poles, the Magnetic Poles, the Foci of Maximum Magnetic Intensity, and the Points of Maximum Cold

(8) Give the elevation of the Line of Perpetual Congelation in Iceland and the Countries on the Arctic Circle, stating particulars as to its local reduction in Summer

(9) Name the greater Periodical Air-currents in the North and South Hemispheres, and show how they are influenced by the Physical Geography of the areas where they prevail

(10) How and to what extent are the nature and characters of a district influenced by the nature and characters of its strata and other rock-masses? Give examples

(11) Compare the mean annual temperature and climate of either England and the Falkland Isles, or Gibraltar and the Cape of Good Hope, these having, respectively, nearly the same latitude in the northern and southern hemispheres

(12) What is the normal colour of the Sea? To what several causes is its alteration in colour due, as well in the greater Oceans as in the Red, Vermilion, Black, and Yellow Seas, the Persian Gulf, Arctic Ocean, and Gulf of Guinea.

(13) Compare the coast of Greenland with that of Norway, as to physical features and conditions What other coasts offer similar appearances? Can you account for their peculiar configuration?

(14) How would you determine whether Islands adjacent one to another, or to the mainland, had or had not at any period formed part of a greater area of land? Explain the value of any known evidence of the existence of a great continent of which the Islands of Oceania might be the existing relics.

(15) Mention the principal Food-plants, the places whence they were originally obtained, where they are now cultivated, and where they are chiefly consumed

(16) In what does a Plateau differ from a Plain? Describe the physical features of one example of each, with remarks on its fauna and flora. Why are great cities situated chiefly on plains?

(17) Draw a rough map on any suitable scale from the following notes:—

Having landed on a promontory, **A**, I am directed to survey the estuary of a river lying N of this point. My note-book finally contained the following data

Took bearings from **A**, of lighthouse on E end of island **I**, in the estuary, and hillock at its western extremity Found the former to be N N E, and the latter N Walked along range of hills marking the central ridge of the promontory in a N E direction At 2000 yards top of first hill, **B** Bearing of lighthouse N W and of hillock W N W Observed a small headland, **C**, in bay S of the promontory, bearing S S E, and distant 1500 yards (by pacing) Between this and **A** the coast nearly straight, but from **C** it curved inwards to the E, and then to the W, cutting the same bearing S S E at about 1000 yards from **C** Returned to hill **B**

Walked from **B** N E to second hill, **F**, distance 1000 yards Coast bears N W 750 yards Ground sinks gently from **F** for 1000 yards, when a main road bearing N N W is reached At 500 yards, going N N W, bridge of three spans crosses the estuary Coast-line from **A** to bridge curved slightly towards the N From bridge, eastwards, stream bears E N E, and is of uniform width At N end of bridge a small village, with roads leading N E, N, and W N W

Walked by the last 1500 yards, found headland **D** bearing S 750 yards Coast between **D** and bridge slightly indented At 2100 yards promontory **A** bore due S At 4000 yards reached small fort Headland **E** bore S W 2500 yards Coast between **E** and **D** forms a bay, the most northern curve of which is 1000 yards from fort, and bears S S E

From fort walked on original bearing, W N W, to coast, distant 1500 yards from fort Steep cliffs Coast-line from **E** nearly straight, and apparently continues so to the N From fort, main road ran N N W, nearly parallel to cliffs

No. 2 Examination Paper, 1876

Special.

[*Candidates are not to answer more than* **Eight** *Questions in this Paper*]

(1) Make a sketch-map of the North Polar Sea, with its coasts and islands, as far south as the Arctic Circle, together with Iceland and the whole of Greenland, especially indicating the direction of marine currents, and the localities of volcanoes, large glaciers, rivers, and mountains

(2) State the known laws governing the decrease of Mean Temperature with increase of Latitude in the Arctic Regions, and explain how the seasonal variations of Temperature are exaggerated by the local geographical features

(3) State what is known of the southern extent of the permanently frozen substratum, of the theoretical underground limit in the Arctic Regions for the effects of the alternate seasons, and the depth to which the summer thaw reaches

(4) Define Icefloe, Packice, Icefoot, and Iceberg, and describe the origin of the Icebergs of Davis Strait, and the local results of their dissolution

(5) State succinctly what is known of the Tides and Marine Currents of the Circumpolar waters, and what bearing they have on the hypothesis of an Open Polar Sea

(6) Give some account of the Mountain-ranges which reach or approach the Circumpolar Coasts, pointing out their directions, and their influence on the shape and other conditions of the neighbouring lands, and the systems of Arctic drainage to which they give rise

(7) What evidences have been offered of oscillations in the relative levels of land and sea for Siberia, Nova Zembla, Spitzbergen, Greenland, Arctic America, and the Parry Islands?

(8) Compare the Tundras of Siberia with the Barren Lands of Arctic America, as to relative position, aspect, vegetation, and origin

(9) Describe the geographical features of Iceland, and give some particulars of the eruptive boiling-springs, together with the hypotheses explanatory of their action, as advanced by Mackenzie and Bunsen Illustrate the answer with a sketch-map and diagrams

(10) Define the limits of Vegetation in the Arctic Regions, and give a special account of the Distribution of Plants in either Arctic Europe, Arctic Asia, Arctic West America, Arctic East America and its Archipelago, Greenland, Iceland, or Spitzbergen, with notes on any local abundance or relative luxuriance, and on accumulations of Peat, and occurrence of Drift-wood and of Fossil Plants, in the region selected

(11) Enumerate the chief kinds of Skins and Furs obtained in the Arctic Regions, and note the localities and range of the animals yielding them Mention other Arctic animal products used in commerce, and their sources

(12) Name the nations or races of mankind known to inhabit the Arctic lands and islands, including Iceland and all Greenland, group them according to some received Anthropological system, and point out how their existence, characters, and probable migrations have been influenced by geographical conditions

POLITICAL GEOGRAPHY.

No. 1 EXAMINATION PAPER, 1876.

General

[*Candidates are not to answer more than* **Twelve** *Questions in this Paper.*]

(1) Explain what is meant by Latitude and Longitude, and how each is usually obtained Give the longitudes of Tobolsk and the Orkney Islands, on the 59th parallel, and also give their distance apart in geographical miles

(2) Give the names, latitudes and longitudes, of the great terminal capes of Greenland, South America, Hindostan, and Africa and also of the most northern extremes of the continents of Europe, Asia, and America Name two or three of the most elevated cities in the world, and name some of the largest Islands (exclusive of Britain and Australia) in each quarter of the globe

(3) What are the approximate areas of British North America, Australia, Spain, Japan, and Iceland? Give some idea of the size and importance of the Rivers Yang-tze-Kiang, Amazon, Euphrates, and Rhine. Give

also the names and elevations of two or three of the loftiest mountain peaks in North America, South America, Asia, and Africa.

(4) What were the boundaries of the Russian territory, and of the Kingdom of Sardinia, before the war of 1854? and what are now the boundaries of Germany and Denmark?

(5) State the general effect of the Suez Canal upon the commerce and shipping of the United States, Italy, and France

(6) Enumerate the principal British Possessions, their chief productions, and the languages which are in most general use in each State what places in our possession would acquire increased importance in a time of war, in consequence of their geographical position

(7) Give the approximate population of the following countries, and name the races of which they are composed —United States, Chili, Sweden, Egypt, the Cape (of Good Hope) Colony, and Japan Also name the countries which are inhabited, either exclusively or mainly, by the Mongolian race.

(8) Describe Malta, Jamaica, Mauritius, and the Sandwich Islands, giving a brief historical sketch of each

(9) State what European and African territory we now hold, how, and when we came into possession, and what commercial or other advantages we derive from each

(10) Where are the following places, to whom do they belong, and what are they best known to us for —Porto-Bello, Tahiti, Aland Islands, Caraccas, Herat, Chincha Islands, Acapulco, Bankok, Victoria Land (southern hemisphere), Sinope, Mosul, and Goa?

(11) Commencing at Behring Strait, enumerate in succession the countries occupying the entire western seaboard of America, naming the capital or chief town of each, and giving some little information about the inhabitants, and the mineral and other productions of each country

(12). What were the principal routes of European commerce at the most flourishing period of the Roman Empire, also at the close of the seventeenth century, and what changes have taken place since the latter period?

(13) Make a sketch-map of the coast-line of the following kingdoms, shewing their principal seaports, capes, and bays —Denmark, Holland, France, and Spain, and write a brief description of the foreign possessions of each of these kingdoms

(14) What were the boundaries of the United States of America 100 years ago, what are they now, what are the chief results of the Confederate War, and what are the principal mineral productions of the United States?

(15) Describe in general terms the effect of the geographical circumstances of a country upon its inhabitants, as regards climate, elevation, insularity, fertility, and facilities for foreign intercourse, giving instances by way of illustration. Name the chief articles of subsistence amongst the Greenlanders, Hindoos, Pampas Indians, and South Sea Islanders

(16). Give the distance, in geographical miles, between Paris and Teheran, also between Teheran and Calcutta State what countries lie in the direct line from Teheran to these cities, and give a brief account of such of them as are situated in Asia.

(17). Compare the condition of the people of England, and also its climate and vegetable productions, with those of places in a similar latitude on the East and West Coasts of North America, in European Russia, and also in a corresponding degree of latitude in South America.

(18). Name all the countries or states, together with their capitals or chief towns, which border on British India, and describe briefly four of the principal cities within our Indian Empire.

No 2 EXAMINATION PAPER, 1876.

Special

[*Candidates are not to answer more than* **Eight** *Questions in this Paper*]

(1) State what you know of the voyages of Arctic discovery prior to the seventeenth century, the causes which led to, and sustained an interest in them, and the results which flowed from them, and give the dates of discovery of Nova Zembla, Spitzbergen, Iceland, Greenland, and Newfoundland

(2) Give the known limits in latitude and longitude of Greenland, describe the country, its inhabitants, and productions, and give a sketch of its history, from its earliest colonization down to the present time

(3) Describe briefly the course of Arctic exploration, from the commencement of the seventeenth century down to Her Majesty's accession to the throne, showing what geographical discoveries were made, what were the incentives to such continued exertion, and who were the most renowned discoverers

(4) Describe Iceland, its climate and inhabitants, give its limits of latitude and longitude, its area and products, also the name of its capital

(5). Give an account of the discovery of the Arctic shores of Asia, how, when, and by whom accomplished, describe the inhabitants and their mode of life, name the principal islands which lie off the coast, and say what is their commercial value, also name the principal Asiatic rivers which flow into the Polar Sea

(6). Give a similar account of the discovery of the Arctic shores of America, how, when, and by whom accomplished, describe the inhabitants and their mode of life, name the chief rivers flowing into the Arctic Sea, also name the chief islands lying off the coast, and say which of them are inhabited

(7) What Arctic discoveries have been made during Her Majesty's reign, and with what objects were these explorations instituted? Describe Franklin's expedition, and its effect upon Arctic research

(8) Give latitude and longitude of Behring Strait, and say what explorations and discoveries have been made from thence Give latitude and longitude of the most northern lands yet discovered, by whom, and when, give latitude and longitude, and names of the most northern settlements of white men, and also of natives

(9) When, how, and by what Expedition was the earliest discovery of a North-West Passage completed, have ships or men ever passed through from one ocean to the other, and, if so, in what space of time? What would be the commercial value of a North-West Passage? To what extent has the Arctic shore of America been navigated by ship or boat?

(10) Give an outline of the most notable attempts to reach the North Pole, and state the highest latitude which has ever been reached with certainty, when, and by whom. Has the experience thus obtained been decisive, as regards the impossibility of reaching it, or otherwise?

(11) Give some description of Melville Island, and of its climate Explain the manner in which the greater part of all recent Arctic geographical discoveries have been made

(12). State what Arctic discoveries have been made, first, by the English, and, secondly, by all other nations Give an outline of the Arctic Whale fisheries, by whom and when commenced, also give some idea of their present extent, annual value, and by whom carried on Give some idea of the Arctic Seal fishery, as now carried on by the English

The following are the names of the successful competitors :-

PHYSICAL GEOGRAPHY.

		Age	
Gold Medal	John Wilkie	16	*Liverpool College*
Bronze Medal	Walter New	16	*Dulwich College*

Honourably Mentioned.

	Age	
J A Robinson	17	*Liverpool College*
L P Jacks	15	*University School, Nottingham*
E von Lengerke	17½	*Haileybury College.*
Sir M Crofton	18	*Eton College*
F S Carey	15¼	*Bristol Grammar School*

POLITICAL GEOGRAPHY.

		Age	
Gold Medal	Thomas Knox	16½	*Haileybury College*
Bronze Medal	W M H Milner	16½	*Marlborough College*

Honourably Mentioned.

		Age	
	J B Johnston	13½	*Edinburgh High School*
	H. W Pigeon	16	*Clifton College.*
	J. F Heyes	18	*Liverpool College.*
	W. J. Newton	15	*Liverpool College*
Equal	A R Ropes	15½	*City of London School*
	C W MacMaster	17	*Rathmines School, Dublin*

REPORTS OF THE EXAMINERS FOR 1876.

I.—PHYSICAL GEOGRAPHY.

To the Council of the Royal Geographical Society

GENTLEMEN, YORKTOWN, 5th April, 1876

The examination of the seventy papers of Answers, from thirty-five candidates, proves that seventeen of the candidates show a highly satisfactory amount of information on the subjects set before them

Of these seventeen, the best is John Wilkie His papers are clear, systematic, and comprehensive, showing a very good general knowledge of Physical Geography, and a good special knowledge of Arctic countries and conditions, as obtained from a careful study of published works

Walter New is not far behind Wilkie His reading has brought good results, but his knowledge of Physical Geography is not so broad and sound as that of Wilkie

John Alfred Robinson is decidedly the next best, systematic, with well digested reading He deserves Honourable Mention, so also do L P Jacks, Edward von Lengerke, Malby Crofton, and F Stanton Carey, whose papers are not far apart among themselves, though considerably inferior to that of Robinson

With regard to the Answers to the several questions proposed, I may remark that for the General Paper, the answers to Question 1 were few and imperfect Questions 2, 3, 7, 9, 12, 13, 14, 15, and 16 were chiefly taken up The British Hill Ranges (Question No 5) seem to be very poorly known The Survey Map (Question No 18) was undertaken by twelve out of the thirty-five, fairly executed by four, and well attempted by four others In the Special Paper, Questions Nos. 2 and 3 were seldom handled and very rarely well

On the whole, a larger proportion of marks have been obtained for the Special Paper than for the paper on General Physical Geography, showing a more or less careful study of the special books on Arctic phenomena This is mostly accompanied by a fair knowledge of the principles and facts of Physical Geography, excepting where they are especially concerned with geological structure. In the latter case more definite knowledge, based on better teaching, is evidently required

I am, Gentlemen, your obedient servant,

T Rupert Jones.

II —POLITICAL GEOGRAPHY.

To the Council of the Royal Geographical Society.

Portsmouth Dockyard,
19th April, 1876

Gentlemen,

I beg to report upon the nineteen Examination Papers which have been worked and sent to me

I have no difficulty in assigning the medals, thus —

1. **Gold Medal** .	Thomas Knox
2 **Bronze Medal**	W M. H Milner

Deserving of Honourable Mention

J B Johnston.
H W Pigeon
J F Heyes
W J Newton
A R Ropes, } Equal
Wm MacMaster }

The only information which I possess respecting these youths, is their place of education (Knox excepted)

The answering of the other boys was not at all equal to that of the beforementioned

It appears deserving of consideration whether fewer questions requiring more precise answers, or whether a little more time to answer them in, would not more satisfactorily test the knowledge of the candidates

I am, Gentlemen, your obedient servant,

F. L McClintock

PROGRAMME FOR 1877.

THE Council of the Society have satisfaction in repeating the offer of Prize Medals for the ensuing year, and have invited the following Public Schools to take part in the competition —

List of Schools invited to compete in 1877.

English Schools—St. Peter's College, Radley, Abingdon, King Edward's School, Birmingham, Brighton College, Bristol Grammar School, Cathedral Grammar School, Chester, Cheltenham College, Clifton College, Dulwich College, Eton College, Haileybury College, Harrow, Hurstpierpoint, Liverpool College, Liverpool Institute, London,—Charter House, Christ's Hospital, City of London School, King's College School, St Paul's, University College School, Westminster School, Royal Naval School, New Cross,—The College, Malvern, Manchester School, Marlborough College, University School, Nottingham, Repton, Rossall, Rugby, King's School, Sherborne, Shoreham, Shrewsbury, Stonyhurst College, Blackburn, The School, Tonbridge, Uppingham School, Wellington College, Winchester College

Channel Islands School—Victoria College, Jersey

Scotch Schools—Aberdeen Grammar School, Edinburgh Academy, Edinburgh High School, Glasgow High School, Glasgow Academy

Irish Schools—Royal Academical Institute, Belfast, Dungannon Royal School, Ennis College, Portora Royal School, Enniskillen, Foyle College, Londonderry, Rathfarnham, St. Columba's College, Rathmines School, Dublin

Syllabus of Examinations for the Prize Medals of the ROYAL GEOGRAPHICAL SOCIETY *in* 1877.

EXAMINATION IN PHYSICAL GEOGRAPHY.

This Examination will take place simultaneously at the several invited Schools, according to printed regulations (which will be forwarded in due time), on the third Monday in March, 1876, and will consist of two papers of three hours each, the one to be answered between 9 and 12, 9½ and 12½, or 10 and 1 A M (according to the convenience of the School), and the other between 2 and 5, 2½ and 5½, or 3 and 6 P M

N B It is necessary, in order that Candidates may be admitted to the Examination, that their names be sent in to the Secretary of the Society on or before the *first* Monday in March.

No 1 *Examination Paper* will consist of questions on the following subjects —

A *Configuration of the Earth*, as learnt by careful study of a globe. What are the distances, speaking roughly, between such remote places as may be specified? What places of importance lie on the direct lines between them, and what is the section along each? What are the relative size, elevation, &c, speaking roughly, of such well-known districts, mountains, and rivers, as may be specified?

B *General Physical Geography* — Distribution of land and sea, forests, plateaux, glaciers, volcanoes, man, animals, plants and minerals, climates and seasons, oceanic, meteorological and magnetic phenomena

⁂ Extra marks will be allowed for sketches, but only so far as they are effective illustrations of what cannot otherwise be easily expressed The use of blue and red pencils is permitted for this purpose No marks will be given for neatness of execution, apart from accuracy Some of the questions will be framed so as to make illustrations by sketches obligatory

The candidates may be required to construct a rough map without the aid of special instruments, from a brief description of a district illustrated by itineraries and bearings

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No 2 *Examination Paper* will consist wholly of questions on a special subject

The special subject appointed for 1877 is—

AFRICA, SOUTH OF THE EQUATOR

EXAMINATION IN POLITICAL GEOGRAPHY

This Examination will take place simultaneously at the several invited Schools, at the same hours and under precisely the same regulations as those in Physical Geography.

No. 1 *Examination Paper* will consist of questions on the following subjects:—

A. *Descriptive Geography.*—Explanation of latitude and longitude. What are the distances in geographical miles, speaking roughly, and as learnt by the careful study of a globe, between such remote places as may be specified? What places of importance lie on the direct line between them? What is the relative size, speaking roughly, of such well-known countries, mountains, and rivers, as may be specified?

B. *Historical Geography.*—Embracing (1) the boundaries of states and empires at different historical periods, (2) the chief lines of commerce, ancient and modern, (3) the influence of geographical features and conditions upon the distribution of races and political history of mankind.

⁂ Extra marks will be allowed for maps and sketches, but only so far as they are effective illustrations of what cannot otherwise be easily expressed. The use of blue and red pencils is permitted for this purpose. No marks will be given for neatness of execution, apart from accuracy. Some of the questions will be framed so as to make illustrations by sketches obligatory.

The candidates may be required to construct a rough map without the aid of special instruments, from a brief description of a district illustrated by itineraries and bearings.

No. 2 *Examination Paper* will consist wholly of questions on a special subject.

The special subject appointed for 1877 is—

AFRICA, SOUTH OF THE EQUATOR.

Candidates will be expected to be acquainted with the History of Geographical Discovery in the Southern half of Africa.

The following books contain much information regarding the Physical and Historical Geography of Southern Africa:—

1. Livingstone's 'Missionary Travels and Researches.' London: Murray.
2. Livingstone's 'Zambesi and its Tributaries.' London: Murray. 1865.
3. Burton's 'Lake Regions of Central Africa.' London, 1860.
4. Speke's 'Journal of the Discovery of the Sources of the Nile' (as far as regards the regions south of the Equator). London, 1863.

5 Grant's 'Walk across Africa' London, 1864.

6 Stanley's 'How I found Livingstone' London, 1872.

7 Cameron (Results in course of publication)

8 Galton's 'Narrative of an Explorer in Tropical South Africa' London Murray 1853

9 Andersson's 'Lake N'Gami, or Explorations in South-West Africa' London, 1856

10 Tuckey's 'Narrative of an Expedition to Explore the Congo' London, 1818

11 Monteiro's 'Angola and the River Congo' London Macmillan. 1875.

12 Burchell's 'Travels in the Interior of South Africa'

13. Brooks' 'Natal' Edited by Di Mann. London: Reeve and Co. 1876

14 The Article "Africa," in the new Edition of the 'Encyclopædia Britannica'

As regards Ethnology—

15 Waitz, 'Negervolker und ihre Verwandten' Leipsic, 1860

16 Burton 'On the Lake Regions,' &c, forming Vol. XXIX. of the 'Journal of the Royal Geographical Society,' 1859.

INDEX

TO

VOLUME THE TWENTIETH.

Abaka, Chief, 267
Abasi, King, 229
Abou-Arouck, Wady, 358
Abou-Gimri, Wady, 357
Abrus precatorius, 348, 349
Abul Ghazi Khan, 181
—— Hussein, Chief, 67
Acaray, Cerros of, 495
Adams, Capt, 20, Remarks on the Weather, Winds, and Ice in the Arctic Seas during the past Season, as affecting the Prospects of the Arctic Expedition From Observations in Davis Strait and Baffin Bay, 1875, 160
Adiabo, village, 224, 227
Admiralty Surveys, 402 *et seq*
Afghanistan, unexplored districts of, 241, divisions of, 242
Africa, Journey across, from Bagamoyo to Benguela, by Lieut V L Cameron, 304 *et seq.*
Aga-Wat-el-Mek, Mohammed, 470
Agudos Range, 462, 463
Ahimbè Lake, 125
Akem, District of, West Africa, Capt J S Hay, on, 475 *et seq*
Akhals, the, 175
Aklangar, well of, 487
Alai, the, 484
"Al-aman," signification of, 168 and note, 168
Alambary settlement, 461
Alatsinainy Angavo, 111
Albani, Sharif of Mecca, 216
Albert Nyanza, the, 54, 473, 474, 475, Journey towards the, beyond the Cataracts of the Upper Nile, by Lieut W H Chippendall, 67 *et seq*, Nile traced into the, 470, Gen C M P Stone on the Circumnavigation of the, 470, Sir S. Baker on its exploration, 471.
'Albert N'yanza,' Sir S. Baker's, extract from, 472.
Alcock, Sir Rutherford, on Mr Margary's Journal, 206 *et seq*, on the Lake Nyassa Mission, 454, on Mr Bigg-Wither's exploration of the valley of the Tibagy, Brazil, 468, on the Circumnavigation of the Albert Nyanza, 471 473, on exploration in Central Africa, 474, on the Geography of Eastern Turkistan, 492 495
Alegre, Monte, 460
Alert, the, 55, 56, 57, 58, 60, 64, 66, 415
Aleurites, candle-nut tree, 351
Alexander the Great, 179, supposed ruined fortress of, 166
Alexanderson, commander of the *Frances Cameron*, 183
Ali, traditional foot-print of, 166
Ali Gua mir Aldin, 217
Alington, Rev C, 75
Alionde, King, 78
Allahu-akbar Pass, 170
"Alluvial fans," convex deltas of loose material, 487
Alto Parana, 494
Altos, Cordillera of, 495
Alvez, Portuguese trader, 315, 316, 317 318, 320
Alviz, José Antonio, 121, 122, 123, 131
Amador, King, 78
Amambay Height, 494, Plateau, 494
Ambohiranoiana, 112
Amonzi River, 158
Ampotaka, 112
Amu Daria Expedition, 418
Andansonia digitata, baobab-tree, 361
Anderson, Capt, on the North-American Boundary from the Lake of the Woods to the Rocky Mountains, 274 *et seq.*, 434
————, Dr, 198, 426, continuation of Mr Margary's travels, in extracts from his letters, 208 *et seq*
Andranarivo, 110
Angori Valley, 244
An-hsun, prefectural city, 196
Anjeree Hills, 178

Ankotso rock, 110
An ning Chou, 204
Antananarivo to Mojunga, Journey from, by J Howard Maynard, 110 *et seq*
Antinori, Marchesi, 444
Antsianaka, 110
Anuapata, or Port Moresby, 330, 331, healthiness of, 338
Anyankopong, deity of the Chwee, 479
Apa River, 494, 498
Apipé Island, 498
Apollonius Rhodius, 215
Apucarana Range, 463
——— and Agudos volcanic range, 461, 466
Apuddo, village, 38
Aqua Efe, hamlet, 224
Aquidaban River, 498
Archer, Lieut, 58
Archibong's Landing, 227, 228; grand fall near, 229
Arctic, the, 160
Arctic Expedition, 19, 403, 415, Mr C R Markham on the Progress of, 55 *et seq* , Track of, from Portsmouth to the Waigat, 66, Remarks by Capt Adams on the Weather, Winds, and Ice, in Davis Strait and Baffin Bay, 1875, 160
Areguá, Cerro, 495
Argandab River, 243, 244
Ariel, kind of antelope, 359
Arnold, Mr Edwin, 50
Arrow, Sir Frederick, obituary notice, 400
Arroyo Claro, 494
Arsacides, the, 179
Arve Prins Island, 58, 62
Asamang, town, 476
Asante, Rev David, native missionary, Akem, West Africa, 479
Askja, crater of, 28
Asp-o-Narza stream, 167
Assistance, the, 56
Assungui, English colony at, ill chosen, 467
Astabene, 179
Astrolabe, Mount, 266, 332, 355
Asuncion, 500, 505, Plateau, 495
Asuquay, village, 227
Asyuka, village, 441
Atak Range, 174, country, 175
Atanekerdluk Harbour, 63, 65
Atrak River, 170
Attrek, probably a corruption of the Derbiccæ tribe, 181
——— River, 176
Aufina, Chief, 470, 473
Aukanyong, village, 226, 227
Aute, Chief, 255, 272

Badakshân, 483
Badger, Dr, on Lieut Cameron's Journey across Africa, 327
Badgley, Capt, 423
Baer's law in regard to river-banks, 178, 499
Baffin Bay, 65
Bahr-ingo said to be a country, 47, 146.
——— Lake, 37, 43
——— of Speke, identified by Mr Stanley, 436
Bahr Kuta River, 130
Baikana stream, 334
Bailunda country, 324
Baines, Thomas, obituary notice, 389
Baker, Lieut, 127
———, Sir Samuel, 36, 47, 151, 308, 326, 470, on Col Gordon's Expedition, 54, on the Albert Nyanza, 471
Balanites egyptiaca, 361
Balor, 483, 490
Balti Province, 483, 490
Balunda tribe, 126
Bambarre Mountains, 310
Bampton Island, 254, murder of native teachers on, 338
Banda Sea, 109
Banks Island, 105
Baobab-tree, 361.
Bara, 360
Barclay, Mr, British Commissioner, 277
Barfurush, 174 *note*
Bargaguel, wells of, 357
Bari tribe, 51
Baringo, or Nduru, district, 157
Barker, Frederick, death of, 159
Baroni, village, 269
Barth, Dr, 152
Barthema, Ludovico, 222
Basilisk, the, 127
Bates Island, 228
Baxter River, 353
———, Miss, of Dundee, 92, 93
Bavali Point, 70
Beardall, Mr, 74
Beecroft, Capt, 229
Begoro, town, 477
Behm, Dr, 128
Belgians, King of the, International Geographical Congress advocated by, 454
Bellefonds, Col Linant de, 151, 153, 436
Bellville, Alfred, Trip round the South End of Zanzibar Island, 69 *et seq* , Journey to the Universities' Mission Station of Magila, on the Borders of the Usambara Country, 74 *et seq*
Bembatoka Bay, 114
Bembè Lake, 125
Benguela, 127
Berem River, 476
Beverley, Mr W, 425
Beyal, 148
Bhamô, 211
Bíbí Nani (Nannea or Diana), shrine of, 246.

Biddulph, Capt., 486, 489.
Bigg-Wither, Mr T P, 435, on the Valley of Tibagy, Brazil, 455 *et seq*
Bihé country, 324, River, 320, people, brutal character of, 325
Birch, Hon J. W W, obituary notice, 401
Binka, native name of highest point of Mount Owen Stanley, 268, 332.
Birjund, 174
Bismarck, Cape, 61
Bitoka Peak, 332
Blackfoot Indians, 293, 299
Boigu, 93, 94, Island, 105, 108, Pass, 94, people, 95, 96, 106
Boiling Lake, Discovery of, in Dominica, by Mr H Prestoe, 230, 231.
Boloko, Chief, 355
Bombax pentandrum, cotton-tree, 335
Bombay, native attendant, 314, 317
Bombazine, Mr Margary's servant, 208
Bompong River, 476
Bootlers Inlet, 334
Bori-Tokai River Pass, 489
Botocudo tribe, 465.
Bourdarma tribe, 79
Bourgbaie, town, 78
Boyya, 72
Brazza, Count di, 442
Breadalbane, the, 64
Breithamerki Jokull, 22
Bridge Island, 155
Brilhante River, 466, Valley, 455
Bristow Island, 254
British Association, Bristol Meeting, 1875, 8, Address to the Geographical Section of, by Lieut-Gen R Strachey, President of the Section, 79 *et seq.*
Broadbent, Mr, 266
Broadhead, Mr G C, 432
Brodrick, Hon G C, on the Public Schools Prize Medals, 373
Brood, Mr, 63
Browne, Col. Horace, 212
Buceros ruficollis, horn-bill, 351, 352
Bugeyeya Island, 147.
Bugran River, 247
Bugré, wild Indians, 455
Bujnúrd, town, 172.
Bulldog, the, 61
Bumbireh Island, 42
Burnes, 167 *note*, 169, 173
Burton, Capt., 38, 47, 49, 75, 326, works of, on Iceland, 416.
Butler, Capt., death of, 424
——, Major, on the International Boundary Line, North America, 299
Buzimâni River, 125
Bweyu, village, 72, 74

Caffunont, 360
Cagmar, 359
Caioá Indians, 464
Calabar River, the Old, Visit to, by Capt. J B Walker, 224
Calamus australis, climbing palm, vigorous growth of, 351
Cameron, Lieut, 49, 50, 183, 435, 437, 438, 439, 440, 441, 474, Letters from, detailing the Journey of the Livingstone East Coast Expedition from Lake Tanganyika to the West Coast of Africa, 118 *et seq*, on his Journey across Africa, from Bagamoyo to Benguela, 304 *et seq* presentation of Gold Medal to, 368, on the extent of the Victoria Nyanza, 475
————, Major D R, 276, 434, on the International Boundary, North America, 297
Canabe River, 498
Canadian-Pacific Railway, proposed, 302
Canarium, Kanary nut-trees, 351
Canklum, village, 235
Cannibalism attributable to revenge, 109
Canoa Island, 347, 350
Cappu pyta grass, 496
Capper, Mr Robert, 132 note
Carandy (*Copernicia*), black palm, 497 forests of, 497
Carapegua, village, 497
Carpenter, Mr Herbert, 61
Carpophaga, fruit-eating pigeons, 351
———— *spilora*, black and white pigeons, 352
Cary Islands, 59
Cascade Point, 102
Cassowary, 352
Cauchois, M, 323
Ceyx solitaria, kingfisher, 351
Chaco, the, storms of, 503
Chadda River, 227
Chaga Promontory, 147
Challenger, the, 405, 409, Expedition, 80.
Chambeze River, 133, 324
Champion Bay, 408
Cha'ng-tê, city, 188
Chan-i Chou, city, 200
Chao-chow, city, 208
Chapushlu, 171
Chashma Gilas, spring, 170
Chashma-i-Ali, or Fount of Ali, 166
Chekanoffsky, M, 418
Chên-ch'i Hsien, 191
Ch'ên-chou Fu, 191
Chên-ning Chou, 196
Ch'ên-yuen Fu, 191, 207
Chérème, wells of, 360
Chester, Lieut, 254, 258, 260, 262.
Chevert, the, 94
Cheysimbee Mountain, 42
Chia-yu Hsien, city, 185
Chinaran, village, 170
Ching-ch'i Hsien, 195
Ch'ing-p'ing Hsien, 192

Chippendall, Lieut W H, Journey beyond the Cataracts of the Upper Nile towards the Albert Nyanza, 67 *et seq*, 442
Chiwyu, 137
Christie, Capt, 174
Chuaka Inlet, 72, village, 73
Ch'u-hsiung, city, 205
Chuke, 78
Chumah, the late Dr Livingstone's native attendant, 15, 69, 71, 74, 77, 308, 446
Chung-chia, social outcasts, 198
Chun-shan Island, 187
Chwee people, 479, 480
Cinchona cultivation, 232
Cicinnurus regia, King Bird of Paradise, 351
Cleghorn, Dr, 245 *note*
'Clouds in the East,' by Col Baker, 427
Cochlearia Groenlandica, scurvy grass, used as salad, 59
Combira, or Kwarumba, Chief, 123, 124.
Coix lachryma, "Job's Tears," 350
Coli ibone Hills, 230, 232
Colonia Dourados, military outpost, violent storm at, 504
—— Nova, colony of tame Coroados, 464
Colston, Staff-Col R E, Itinerary from Debbe to El Obeyed, on the Upper Nile, 357 *et seq*
Columba migratoria, American passenger pigeon, 352
Comisene, or Damghan, 179
Comstock, Brigadier-Gen C B, 433
Conceição, Salto da, 458
Conchas, village, 456
Conder, Lieut, 16
Conflict, H M schooner, 265, 266
Congreve, Mr, 502, 504
Connolly, Capt Arthur, 177, 178, 180, 181 *note*, 243
Connor, Lieut E R, real discoverer of the Mai-Kassa, 428
Cooke, Capt, 211
Cooley, Mr, 319, 322
Cooper, Mr H T M, on a proposed Trade Route from the Gambia to Timbuctoo, 78
——, Lieut, 247.
Coroados, wild Indians, 455
Corrá, Cerro, 495
Corrientes Province, 494
Costa, Cerro, 495
Coteau, Great, of the Missouri, 287, 300
Cotterill, Mr H B, 446, 468
Cottesloe, Lord, vote of thanks to Sir H C Rawlinson proposed by, 375
Crawfurd, 'Dictionary' of, 221, 222
Creek Town, 227
Croll, Mr, 85
Cross River, 225, 226.
Crow Indians, 293
Cruces, Cerro de dos, 495
Cuckoo in New Guinea, 354
Curitiba, 455, thriving German colony at, 467
Cyclops, the, 61
Cypress Mountains, 299

Dahæ, Parthian tribe, founders of city of Dehistan, 180, 181
D'Albertis, Signor, 18, 108, 254, 258, 259, 260, 271, 428, Remarks on the Nature and Products of the Fly River, New Guinea, 363 *et seq*
Dall, Mr W H, 433
D'Almeida, Mr Barrington, on New Guinea, 109
Dalrymple, Mr Alexander, 240
Damaghan, town, 166
D'Anville, M, 240
Darahgaz, group of villages, 170
Darnley Island, 105, 346
Darungi, or Durungai, hamlets, 171
Darwin, Mr, 486
Dasht-i-Loot, 174
Daude Papuans, 94
Daulat-Beg Uldi, 490, Valley, 491
Dawson, Lieut, 409
Dayman, Capt, 61
Debbe to El Obeyad, on the Upper Nile, Itinerary of Staff-Col R E Colston, 357 *et seq*
Debou Lake, 78
Deep-Sea Exploring Expedition, 409
Dehistan, city founded by the *Dahæ*, 181
Dehrud, village, 168, 175
Densu River, 476
Derbiccæ tribe, 181
Dickson, Mr Oscar, 21
Dillon, Dr, 304, 305, 307, death of, 308
Dilolo, Lake, 130, 319
Dinpá Valley, 22
Disco Bay, 58, Island, 57
Discovery, the, 56, 57, 58, 60, 61, 66, 415
Dodge, Col, 433
Dominica, Boiling Lake discovered in, 230
Dongolaui Seuba, 67, tribe, 68
Doraudt, M, 418
Drew, Mr F, "alluvial fans" described by, 487
Dufilé, 67, 68, 69
Dufla Expedition, 424
Dufour, Gen, obituary notice, 385.
Duma River, 41, 155
Dunga, village, 73
Dunraven, Lord, 'The Great Divide' by, 432
Durbadan, village, 171.
Duthumi Hills, 305
Dyngufjoll Mountains, 25, 26, 28.

Eastern Turkistan, the Geography of, by a Prince of Kâshghar, Mr R B Shaw, on, 482 *et seq*
Eastwick, Mr, 167, 168
Edinburgh, H R H the Duke of, Speech at Meeting to welcome the Return of Lieut Cameron to London, 303, proposal of vote of thanks to Lieut Cameron by, 528
Edmonton Fort, 296
Edwards, Mr, on the exploration of the Valley of the Tibagy, Brazil, 468
Egerton, Lieut, 58
Ekoi, Visit to, by Capt J B Walker, 226
—— Landing, 229, tribe, 226, 227
El-Aye, wells of, 358
Elborg, Mr, Governor of Godhavn, 57
Elburz Range, 174
Elder, Hon T, 430
Elevara, village, 331
Elias, Mr Nev, Visit to the Valley of the Shueli, in Western Yunnan, 234 *et seq*
El-Jundoul, Wady, 359
El-Kab, ruins of, 357
Ellengowan, the, 92, 93, 100, 105 106, 258, 262, 272, 427, 428
Ellengowan Island, 260
Elliott, American explorer in Brazil, 462, 464
Etima, or Cape Possession, 267
Erranga Seriba, 67
Erub natives, 94
Es-Safi, wells of, 359
Eulophia, highly nutritious root, 245 *note*
Evans, Capt, on New Guinea, 108, on the Fly River exploration, 270, on New Guinea, 354, Admiralty Surveys report by, 402 *et seq*
Ewen, village, 225

Faber, Mr, 456
Fadlalla Bey, Chief, 358
Fagrima, 67, volcanic hills of, 67
Faizabad River, 486
Faloro Seriba, 67
Faufur, kingdom, 223
Farghâna, Andijan or Khokand, Province, 482.
Farjalla Christie, 139
Farler, Rev J P, 74
Farunumo, 269
Fashero, village, 67, 442
Fattatenda, 78
Faulad Muhala Valley, 166
Fedchenko, M, 18, 484
Ferreira, João B, settlement of, 321
Ferrier, M, 167
Fertile Belt, the, 293, 299
Fetishes of the Akem people, 479
Fiakarana, village, 110
Fijiontee tribe, 53.
Findarisk, village, 173
Fireflies, 352
Firuzkuh, village, 166
Fly River, New Guinea, 107, Ascent of the, by Rev S Macfarlane, 253 *et seq*, Remarks on the Nature and Products of, by Signor D'Albertis, 343 *et seq*
Fly, the, 108, 254, 270
Forrest, Mr J, award of Patron's Medal to, 370, 430
Forr Island, 470
Forsyth, Sir T D, explorations of, 482
Fortaleza, 460
Fowena, 53
Fox, the, 64
Fra Mauro, old map by, 214
Frances Cameron, the, 183
Fraser, Baillie, 181
Frederick, Eskimo dog-driver, Arctic Expedition, 58
Freguezia das Conchas, 457
French, Capt, 296
French Association for the Advancement of Science, Meeting at Nantes, 9
Frere, Sir Bartle, 304, 527
Fulford, Lieut, 58
Fume a Kenna, wife of Kasongo, 315

Gaifi, village, 67
Gale Point, 60
Galton, Mr F, on Lieut Cameron's Explorations, 132, on the Public Schools Prize Medals, 372
Gambia to Timbuctoo, on a proposed Route from, by H T M Cooper, 78
Gangang, Princess, 217
Ganges, rate of flow of, 324
Gardanne, General, 174
Garnuah, 360
Garnier, M Francis, 214
Garry, Fort, 275, 298
Gebel-Hossan, 358
Gebel-Kourbadj, 361
Gelete, camp of, 358
George, Staff-Commander C, Note on the height of the Victoria Nyanza, 159
Geral, Serra, 459
Gessi, Signor, 443, 470, 473, 474
Giffard, Lieut, 58
Giles, Mr Ernest, 430, 431
Gill, Rev Wyatt, on the Fly River, 272, on New Guinea, 353
——, Lieut, 169, 171
Gmelin, M, 174 *note*
Goa, 221
Godhavn, 59, 65
Gold-digging, extensive, in Akem country, 476
Goldsmid, Sir F, on Capt the Hon G Napier's Journey on the Turkoman Frontier of Persia, 166 *et seq*

"Gold-teeth" tribe, 239
Gonçalves, Señor, 321, 324
Gondokoro, 51
Goodenough, Commodore, obituary notice, 392
Gordon, Col., 12, 38, 151, 442, 443, 444, 471, 473; Progress of Expedition under, 50 *et seq.*; Letter from the Foreign Office, relating to his expedition to the neighbourhood of Lakes Albert and Nyanza, 473
Gorgi Rapids, 51
Gori River, 41, 155
Goshi Mountain, 155
Goura sp., immense crested pigeon, 351, 356
Gozel-el-Han, Wady, 359
Grande, Salto, or "Big Fall," 458
Grant, Capt., 326, 473
——, Col. J. A., 47, 49; on Mr. H. M. Stanley's Exploration of the Victoria Nyanza, 34 *et seq.*; translation by, of Staff-Col. R. F. Colston's Itinerary from Debbé to El Obeyad, 357 *et seq.*; on Col. Gordon's explorations, 474
—— Island, 228
Gravalunda River, 27
Gray, Lieut. F. J., 406
"Great Divide," author of the, on dealing with Indians, 297
Great Qua River, 225
Gregory Bay, 408
Grekigh, 360
Grimsthathir, 30
Guematourou, 78
Gurgan River, 173
Gursafid, grazing grounds, 166

Haidar, Mirza, 482
Halcyon nigrocyanea, kingfisher, 351.
Hall, Staff-Commander, 404
Hamèd ibn Hamed, 120
Hankow, 184
Hannay, Col., 237, 240
Harad, city, 217, 222
Hare Island, 59
Hargraves, Mr., 266
Harman, Lieut. H. J., 424
Hassanawi, Wady, 358
Hautajwa Hill, 69
Hay, Capt. J. S., on the District of Akem, West Africa, 475 *et seq.*
Hayden, Prof. F. V., 431
Hayward, Serjeant, 181
Hazarah, meaning of, 243; tribes, 247, 251
Hazarah-jat, ruins in, 245
Hector, Dr., 275, 434; on the International Boundary Line, North America, 299
Heer, Professor, 63
Helmund River, 242; upper basins of, 247.
Herthubreith Mountain, 25, 27
Himalaya, the, an impenetrable bar to a modern army, 493
Hissar Expedition, 419
Hobagi, Wady, 358
Hobah, kind of bustard, 359
Holsteinborg, 65; Harbour, 64
Hood, or Hulu, Point, 266, 267, 269
Horns, facial, of the Akem people, 477
Hoskyn, Nav.-Lieut., death of, 408
Howard, Staff-Commander, 408
Hsia, Mandarin, 200
Hsin Chou, 192
Hsin-[illegible], town, 186
H'ui-king, 198
Hudson's Bay Company, 299
Hughes, Mr., Consul, 184
Hu-hsin Chou Island, 185
Hulu language, 269; Point, 260, 267, 269.
Humaita, 500
Humbi, 322
Humdallahi, 78
Humphreys, General, 432
Hu-Nan, geological character of, 189.
Hutchinson, Mrs., 50
Hwang kwo su, village, 196

Ibitipané, Cerro, 495
Iga River, 435
Iki Lake, 124; the Chebungo, or Lincoln, of Livingstone, 312.
Ikiopa River, 110, 112, 113
Ikot-Mba, village, 224
Ikpit, village, 225
Ilala, circumnavigation of Lake Nyassa by the, 445
Ilema, mourning customs of, 340
I-lung Ssŭ, town, 201
Imbiruzinho River, 465
Indian and British races, mixture of, in North America, 298
Indians of North America, mode of dealing with the, 297
Ingpara, village, 224
Inhohô, Campo de, 461, 462
Ipikari, village, 266
Irumba territory, 140, 142
Irangara Island, 154
Irawadi River, 235, 240; Valley, 235.
Irminger, Adm., 56
Iron Rapid, 455
Isabella, Cape, 60
Isidore of Charax, 179
"Isla de Monte," wooded circles in grass-land, 496
Ismail Pasha, 151
——, Sheik, 217
Ituru district, 137
Ivahy Valley, 455
Ivinheima River, 466.

Jacireta Island, 498
Jacobshavn Fiord, 57.

Logan, Sir Wm F, obituary notice, 399
Lochemba Lake, 124
Lohit River, 241
Lomame, or Lomami, River, 124, 125, 129, 312, 313, sources of, 318, valley of, 440
Loman River, 244
London, H M S, 70
Long, Col, 36, 48
Loota-Nzige, "Dead Locust" native name of the Victoria Nyanza, 475.
Losanzi River, 125
Lo-shan, town, 186, 187
Lou-ch'i Hsien, 191
Lour tribe, 68
Lovalé country, 126, 319
Lovoi River, 125, 129
Lowa River, 120, 125
Lowther, Mr, Patron's Medal acknowledged by, in behalf of Mr J Forrest, 371.
Luajerri, of Speke, not a river, 148
Lualaba River, 120, 125, 127, 129, 131, 132, 133, rate of flow of, 324
Lubnanzi River, 124
Luburi, or Luwuli, River, 125, 318
Lucas, Mr, 444
Lu-feng Hsien, city, 204
Lufupa River, 125
Lugerengeri River, 305
Luilhu River, 125
Lukazi stream, 313
Lukoji, or Lukojo, River, 125
Lukongeh, King, 154
Lukuga, outlet of Tanganyika, 125, 309, 324, 437, 438
Lula, Mr. Margary's servant, 208
Lulindi River, 125
Lulua River, 125, source of the, 319
Lumbu River, 125
Lumèji River, 125, sources of, 320
Lungi Mandi, Chief, 123, 317
Lung-li Hsien, 193
Luta Nzige, Lake, 47
Luvijo River, 125
Luvubu River, 125
Luvunguwi River, 125
Luwwa, proper name of the Lualaba River, 125, 309, 324
Luwamberri Plain, 142, 155, River, 41, 145, 151, 155
Luwati River, 125
Luwembi River, 124, 125
Luwik River, 125
Lyell, Sir Charles, 82
Lynch, General, 241, 242, 243, 244, 245, 246, 247, 251
——, Mr T K, 241
Lyngmarken Fjeld, 57.

Maçaime, wells of, 359
Macfarlane, Rev S, 99, 99, 427, 428, 429, Ascent of the Fly River, 253 *et seq*
Macgregor, Col, on Capt the Hon G Napier's Journey on the Turkoman Frontier of Persia, 174, on Afghan geography, 248, 250, 251
Macini country, 78
Mackenzie, Right Hon Holt, obituary notice, 402
Mackay, Mr, 108
——— Expedition, failure of, 18, 19
Macora, 78
McQueen, Mr, 322
Ma'dan Balk, turquoise mines of, 168
Madi Locqun tribe, 51
Maganza country, 145, 154
Magila, Universities' Mission Station, Journey to, by Alfred Bellville, 74 *et seq*
Magomba, Chief, 306
Magu district, 145, 154
Magungo, 53, 470, 474
Mahata, or Maheta, country, 157
Mahomed, Sultan, missionary, 223
Maidankhana Pass, 170
Mai-Kassa, or Baxter River, New Guinea, on the Discovery of, by Octavius C Stone, 92 *et seq*
Mainou, Chief, 254, 255, 256, 262, 264, 271, 272, 343, 347, 349
Maita, stone fruit, 334
Maiva language, 269, mourning customs, 340
Majita Bluff, the Mazita Island of Speke, 41, 145, 154
Major, Mr, 330
Makede, 51, 53
Makraka, 53
Malaiur Island, of Marco Polo, now Singapore, 223
Malatsy, 112
Malik ul Manshur, Sultan, 218
—— ul Zahair, Sultan, 218
Mallet, Mr, 83.
Ma-lung Chou, city, 201
Mani River, 125
Manasu Country, 145, 154
Mangara, 137
Mangasoavina, 112
Mangrullo Point, 494
Manitoba Province, 295
Mansey, 235
Manumanu River, 266.
Manwyne, 210, 213
Manyara Land, 42, 157, Lake, 77
Manyuema, giant grass of, Dr Livingstone's obstruction by, 310
Mar, Sierra do, 466
Mara Chaka, 215, 216.
—— River, 41, 155
—— Silu, 215, 216, 217, 218.
'Marco Polo,' by Col Yule, 237
Marco Polo, 214, 215, 221, 222, 223, 492, Six kingdoms or Cities in Java Minor of,